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A National Environmental/Energy Workforce Assessment. Maine

National Field Research Center, Inc, Iowa City, Iowa

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A National Environmental/Energy Workforce Assessment

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This study is one of 70 volumes assessing the workforce needs (manpower needs) for pollution control and abatement in the United States for the five-year period of 1976 through 1981. Seven fields for pollution control — air, noise, pesticides, potable water, radiation, solid waste, and wastewater — are analyzed, together with energy-related programs currently accentuated by the national effort to solve energy supply problems.

Designed as Phase I of a three-phase program, the complete assessment includes the following volumes: one each for the 50 states, the District of Columbia, Puerto Rico, and the Virgin Islands; one for each of the ten EPA regions; a one-volume National Abstract; a volume on National Legislation; a volume on Business and Industry; and a four-volume National Summary. The information was gathered through extensive personal interviews with responsible federal, state, and local officials in every state; with officials of representative private industrial and commercial firms; and with representatives of national industrial and trade organizations.

Phase II will develop a broad national inventory of the entire range of post-secondary and higher education training offered in the pollution control and energy areas cited above, and Phase III will offer demonstrations for curriculum changes or modifications which appear necessary to assure an adequate and properly trained national environmental/energy workforce.

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for

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Finally, the assistance of Mr. William R. Adams, Jr., Commissioner of the Department of Environmental Protection, and Mr. David E. Tudor, Director of the Bureau of Air Quality Control, in reviewing this document is sincerely appreciated.

PREFACE

This report presents existing workforce levels, training programs, and career potentials and develops staffing level projections (1976 - 1981) based on available information for the State of Maine in the environmental pollution control areas of air, noise, pesticides, potable water, radiation, solid waste, waste water, and energy. This study was carried out for the United States Environmental Protection Agency by National Field Research Center of Iowa City, Iowa.

The information and data presented in this report were compiled in large part from extensive interviews with professionals working in the respective areas and were supplemented by telephone surveys and research.

FOREWORD

The material herein contains the information and data collected for eight individual pollution control inventories conducted for Maine. The format includes workforce profiles, projections, growth and career potential for each of the areas investigated. Growth projections are necessarily based on best professional estimates developed from available information and represent what are felt to be realistic figures by experts in the respective areas. The pollution control areas considered by this study are as follows:

Air

Noise

Pesticides

Potable Water

Radiation

Solid Waste

Waste Water

Energy

National Environmental Energy
Workforce Assessment

Phase I

MAINE

State Summary

I. AIR

Maine's air pollution control program is located in the Department of Environmental Protection. The Bureau of Air Quality is composed of 19 persons with engineers, chemists, and engineering technicians predominating. The Bureau experiences difficulty in recruiting engineers for pollution control jobs because it is felt by program administrators that the state lacks an adequate supply of experienced professionals in this field.

Bureau officials do not anticipate increasing their staff by 1982. Four positions are currently vacant and it is anticipated that they will be filled. If state or federal monies do become available, the Bureau may add a meteorologist and two additional engineers to its present staff by 1982.

Maine does not intend to initiate a mandatory inspection and maintenance program for vehicular emission control. Career potential for air pollution control and abatement jobs appears to be rather limited for the next five year period.

II. NOISE

The State of Maine currently lacks any noise control legislation; however, two departments do share responsibilities in noise abatement and control. The Maine Department of Transportation is charged with Environmental Impact Statement (EIS) review if noise assessments are included. This agency also regulates motor vehicle and powerboat mufflers within the state. The Maine Department of Human Services is charged with responding to any noise complaints within the state; however, again, they operate with no legislative mandate. Within this agency, the Division of Health Engineering has primary responsibility and it has been said that considerably less than one person-year is devoted to noise control. Noise is generally not a problem in Maine due to the state's rural nature; thus it does not appear likely that a formal program with legislative directives will be developing in the near future.

III. PESTICIDES

The new Pesticide Control Act of 1975 provides for the registration of all pesticides sold or distributed in the state. All pesticides are to be classified as to restricted or general use and all applicators using restricted-use pesticides must become certified under the authority of the act.

The Maine Department of Agriculture is charged with responsibility for administering Maine's pesticide laws. The Board of Pesticides Control employs a small staff to handle the day to day operations of pesticide regulatory matters such as investigating complaints and licensing both applicators and dealers.

The Board of Pesticides Control is responsible for both commercial and private pesticide applicator certification within Maine. The Maine Cooperative Extension Service assists in providing applicator training and the Division of Inspection is charged with the registration of all pesticide products marketed within the state. The Board is staffed by a supervisor, a coordinator, and a secretary. The Division of Registration is staffed with a supervisor, three inspectors, and one clerk. Minimal or no growth is projected for the pesticide regulatory staff for the next five years.

State officials anticipate that a total of 2,636 commercial and private pesticide applicators will be certified by October 1977. No increase in the size of the applicator work force is projected through 1981.

IV. POTABLE WATER

The Division of Health Engineering (DHE) of the Maine Department of Human Services' (DHS) Health Bureau is responsible for administering Maine's Drinking Water Program. DHE's activities are supplemented by the Bureau's Public Health Laboratory which tests drinking water for its safety.

The water supply program in the State of Maine is proceeding according to schedule to accept primacy under the federal Safe Drinking Water Act. The necessary legislative mechanism is in place to comply with all federally promulgated standards under PL 93-523.

Since 1974, only one professional employee was added to the staff of the drinking water program. Employee turnover to date has been negligible (less than one percent per annum) and is the result of an extremely limited job market within the state.

Future growth through 1981 will be totally dependent on financial assistance available from EPA and SDWA. State funding of the water supply program is not likely to grow. This stems from the fact that the state's priority commitment to its wastewater treatment facility construction grant program has precluded any increased assistance to the water supply program. It is estimated that 21.2 person-years will be required in FY 1977 and 24.2 person-years will be required in FY 1978 for the implementation of SDWA. It has been suggested that the potential addition of three positions will be utilized for community system compliance with regulations promulgated under SDWA pursuant to state acceptance of primacy.

V. RADIATION

The radiation program of the State of Maine is located in the Division of Health Engineering of the Maine Department of Human Services. The Institutional Health Program of the Division of Health Engineering is the state's principal radiation control group. The Public Health Laboratory, also of the Department of Human Resources, provides environmental sample analysis capabilities for the program.

The Institutional Health Program has a radiation control staff consisting of a director, a radiological chemist, and a technician. Only the radiological chemist devotes full time to radiation control. The technician, who conducts field samples, devotes one day per week to collection of radiological samples.

There are no projected increases in workforce devoted to radiation control within Maine over the next five years. There are no nuclear power plants scheduled to come on-line within the next five years. Career potential at the state level should not develop until 1981 when a second nuclear power unit is scheduled to become operational, thereby increasing the program's monitoring responsibilities.

VI. SOLID WASTE

The Division of Solid Waste Management is the arm of the Department of Environmental Protection responsible for implementing a comprehensive statewide management plan. Educational resources, technical assistance, and cooperation are all tools utilized by the Division to ensure compliance with the state plan. The state plan has basically five specific areas of concern. They are as follows: 1) resource recovery; 2) incineration; 3) storage and transfer facilities; 4) land disposal; and, 5) variance procedures and conditional use permits.

The Division of Solid Waste Management is primarily staffed with sanitary engineers, geologists, engineering technicians, and a geology technician. The effect of the new Resource Conservation and Recovery Act of 1976 on the solid waste program in Maine is indeterminable at this time. Limiting factors include the extent and degree to which federal requirements and standards are promulgated, as well as the federal funding to support the state's program. Most likely, two or three additional positions will be created over the next five year period. Specifically, a soil chemist, a sanitary engineer, and a geologist will be requisitioned pursuant to an increase in Maine's federal grant.

At this time, no provisions have been made for a hazardous waste management plan. The impact which the new federal act will have on the state workforce devoted to develop this task is presently unknown.

VII. WASTEWATER

The wastewater program in Maine is administered through the Bureau of Water Quality Control (BWQC), which has the largest percentage of personnel of the Department of Environmental Protection (DEP). The Bureau is primarily staffed with assistant engineers, environmental technicians, engineering technicians and chemists.

Specific workforce projections for the Bureau of Water Quality Control in Maine's DEP are indeterminable at this time. However, as Maine assumes more responsibility for water quality programs, such as the NPDES permit program, it is likely that increases in the workforce will follow.

The number of certified treatment plant operators which is now approximately 275, with 150 to 200 working within the state, is expected to increase to four or five hundred over the next five years. A substantial increase in career potential in the wastewater field seems likely to occur at the local level for municipal treatment facilities and in the private sector. This will be the result of expanding construction, operation, and monitoring activities which will lead to a growth in demand for treatment facility operators, as well as laboratory maintenance, labor and clerical personnel.

VIII. ENERGY

Maine is the longest, most northeasterly, and least industrialized of the New England states. Energy consumption is primarily for space heating and is highly oil dependent. One nuclear power generating station, the Maine Yankee Atomic Power Plant at Wiscasset, has been operational since 1972. An additional plant, to be located at Sears Island and operated by the Central Maine Utility Company, is currently in the early planning stages.

For the essential short-term conservation planning and the mid- and long-term efforts which must be developed concurrently, the Maine Office of Energy Resources was established in June 1975. In addition to fuel allocation as specified under the federal mandatory petroleum allocation program, the Office of Energy Resources, which employed eight people in 1976, is responsible for:

1) preparation of a comprehensive energy resource plan;

2) preparation of a state energy policy;

3) encouragement and sponsoring of research and development of alternative energy sources;

4) provision of public information of energy matters;

5) provision of technical assistance to public and private groups for energy planning.

STATE OF MAINE - SUMMARY

National Environmental/Energy Workforce Assessment
Pollution Control & Abatement Personnel
Projected Workforce Requirements (1976-1981)

Environmental Area	1976	1977	1978	1979	1980	1981	%/annum growth (average)
AIR[1]	19	19	19	19	19	19	0%
NOISE[2]	2	2	2	2	2	2	0%
PESTICIDES[3]	2,944	(2,944)	(2,944)	(2,944)	(2,944)	(2,944)	0%
POTABLE WATER[4]	331	334	334	334	334	334	N/A
RADIATION[5]	3	3	3	3	3	3	0%
SOLID WASTE[6]	9	--	--	--	--	12	N/A
WASTEWATER[7]	337	--	--	--	--	(550)	N/A
ENERGY[8]	8	--	--	--	--	--	N/A
TOTALS	3,653	--	--	--	--	--	N/A

[1]The above includes only state agency personnel for which no growth is anticipated. Private sector data were unavilable.

[2]The above includes only state agency personnel. Private sector data were unavailable.

[3]The above does not include state laboratory personnel nor the state extension offices personnel.

[4]The above represents 25 state agency personnel as well as 306 certified water treatment facility operators.

[5]The above depicts state agency personnel only and does not include laboratory personnel. Figures for the private sector were unavailable.

[6]The above includes only state agency personnel.

[7]The above includes state agency personnel and certified operators.

[8]The above includes only state agency personnel.

EDUCATION

The Eastern Maine Vocational Technical Institute in Bangor offers a two year course of study in Environmental Control Technology leading to an Associate Degree in Applied Science. The Program was started in 1971 and a total of 78 semester hours are required for this major. Two instructors are assigned to this Program and both have Bachelor of Science degrees. The Program had a 1976 enrollment of 25 students and of the six students which graduated in 1976, four were placed in job-related positions. The Program offers instruction in the basics of microbiology, physics, chemistry, and sanitation and wastewater treatment. Instruction involving the use of environmental control equipment is also offered to students participating in this program. Involvement is also covered by the Program in layout and design of control facilities. It is anticipated that graduates from this Program will be qualified to seek positions in the fields of research, development, sales and operation of environmental control equipment.

Nasson College in Springfield offers a Bachelor of Science degree in Environmental Studies of which there are two major areas: Environmental Studies in Renewable Resources and Environmental Science. There are three options in the Environmental Science major which can provide a student with, according to the College's course description, a "solid scientific background necessary for the systematic study and analysis of environmental problems." The three options offered include Biological Environmental Science, Analytical Environmental Science and Chemical Environmental Science. Nasson College's Environmental Studies Program was created in 1970 and is taught by two professors, one an associate professor and the other an assistant professor.

LEGISLATION

The environmental/energy legislation for Maine was obtained by request from various agency personnel and through various library references. Summaries of the legislation deemed most relevant to the eight subject areas of the workforce assessment were prepared, and are included in the respective state reports. The following list of laws represents virtually all environmental legislation for the state. Only certain of the following laws were summarized; the list is presented to show, by title, the kinds of laws which have been enacted.

Department of Environmental Protection Law

Protection and Improvement of Air Laws

Board of Pesticides Control Law

Pesticide Control Act of 1975

Water for Human Consumption Law

Great Ponds Law

Solid Waste Laws

Protection and Improvement of Waters Law

Sewage Treatment Operators Law

Oil Discharge and Pollution Control Law

Mining and Rehabilitation of Land Law

Alteration of Coastal Wetlands Law

National Environmental Energy Workforce Assessment

Phase I

MAINE

State Report

STATE PROFILE

Maine, the largest of the New England states, was admitted to the Union in 1820. It is the most sparsely populated state east of the Mississippi River, with 1,000,000 people in its 33,215 square mile area. Maine's jurisdiction includes 2,295 square miles of water. It is the easternmost state, bordered by Quebec, New Brunswick, and New Hampshire. The rugged, deeply indented coastline extends 3,478 miles. Approximately 80 percent of the land is forested; 98 percent of which is privately owned. The largest city is Portland, with a population of 60,900.

By most statistical measurements, Maine qualifies as an economically depressed state. The per capita income for 1975 was $4,785 (U.S. average was $5,834). The economy is dependent upon extractive industries (primarily timbering and subsequent processing) and recreational opportunities. Leading products are paper, leather, food and textile items; lumber and wood; transportation equipment; and painting. The percentages of persons employed in the various sectors of the economy are as follows:

Manufacturing	31%
Wholesale and retail trade	17%
Government	15%
Services	11%
Construction	4%
Transportation, communications and public utilities	5%
Other	17%

Maine supplies 75 percent of the nation's lobsters (20 million pounds annually) and 50 percent of the soft-shelled clams. The 150 million cans of sardines packed yearly lead the nation. The annual value of sea products is $48 million. Maine ranks third in potato production (12 percent of the nation's total) and first in supply of seed potatoes. Low bush blueberries, apples, sweet corn, peas, and beans are also grown. Poultry and eggs produce the largest percentage of the total farm income which was $335 million in 1975. Forest products are valued at more than $700 million a year. Sand, gravel, and limestone are the major minerals extracted. Small amounts of copper, zinc, and feldspar contribute to the $38 million annual mineral income. Tourism brings in $542 million a year. Tourists are attracted by the 26 state parks, 2,500 lakes and 5,000 streams, 1,300 wooded islands, 45 public ski slopes, and the scenic sea coast.

The bulk of the population and industry is in the southern part of the state in the area between the New Hampshire border and the Penobscot River. Aroostook County has caribou loam soil; the rest of the state is rocky and difficult to cultivate.

Maine will have to deal with the difficult questions of energy supply, economic expansion and environmental quality as priorities are established for the remainder of this century.

MAINE POLLUTION ABATEMENT AND CONTROL AGENCIES

Four agencies within the State of Maine share pollution abatement and control responsibilities: they include the Department of Environmental Protection, the Department of Human Services, the Department of Agriculture, and the Office of Energy Resources. The Department of Environmental Protection has three bureaus which share environmental responsibilities: Air Quality Control, Land Quality Control, and Water Quality Control. Among the numerous divisions contained within the Department of Human Services, only the Division of Health Engineering appears to have a primary responsibility for pollution control and abatement. The Department of Agriculture has pesticide responsibilities and the Office of Energy Resources is responsible for energy programs.

The Bureau of Air Quality Control is made up of three divisions. The Division of Enforcement is responsible for the enforcement of ambient air standards, emission standards, and regulations along with field activities which include plant investigations, special air monitoring, stack sampling, visual emission evaluations and case development. The Division of Air Quality Services is in charge of planning (review of ambient and emission standards), air quality monitoring, and liaison with federal agencies.

Program operations of the Industrial Services Division include reviewing air pollution abatement plans, providing technical assistance and inspecting dischargers. These programs further function to

assist plant operations and to assure proper operation of abatement equipment. The Division also makes recommendations for licensing actions to the Board of Environmental Protection and conducts source surveillance.

The Bureau of Land Quality Control also consists of three divisions. The Division of Review and Planning has land use responsibilities. The Division of Enforcement is responsible for the enforcement of all Bureau of Land Quality Control laws and regulations along with the follow-up on complaints. Duties of the Division of Solid Waste Management include the development of an environmentally sound and healthful solid waste program, the coordination of the solid waste program with the Bureaus of Air and Water Quality Control, and the responsibility for septic tank sludge disposal and licensing.

With its seven divisions, the Bureau of Water Quality Control appears to be the largest bureau within the Department of Environmental Protection. The Division of Water Quality Services has responsibilities within the following areas: determining the current quality of state waters through monitoring; recommending water quality standards; conducting river basin planning; conducting assimilative capacity studies and analysis; and maintaining water quality data banks. The Division of Industrial Services also assists the Bureau by reviewing and approving industrial abatement and facility plans; providing technical assistance for plant operation; maintaining current data regarding technology; evaluating industrial requests for tax

exemption certification and establishing allowable industrial waste discharge quantities. The Division of Municipal Services deals solely with municipal treatment and abatement problems. The Division of Licensing and Enforcement is responsible for processing applications for waste discharge licenses, enforcing all water laws and regulations, and the follow-up of complaints. The Division of Oil Conveyance Services has responsibilities in the following areas: the maintenance of an ongoing program of terminal and facility inspection and licensing; the establishment of spill management programs for prevention and clean-up; the management of license revenues; and the processing of all spill damage claims. The Division of Laboratory and Field Studies provides all central and field laboratory services and supervises all mobile laboratory personnel. These mobile laboratories provide laboratory services, special investigations, and special studies. Finally, the Division of Lakes and Biological Studies conducts the lakes and water quality monitoring program, provides biological support for other water quality evaluation studies, and provides all biological laboratory support.

The Division of Health Engineering within the Department of Human Services consists of seven subsections, three of which have pollution abatement and control functions. The Waste Water Program supervises control over plumbing and private sewage disposal installations. The Drinking Water Program excercises control over public water supplies.

The Institutional Health Program monitors all sources of ionizing radiation, conducts radioactive determinations on water, air, seaweed, plankton, and shellfish samples and medical use X-ray equipment.

The Maine Department of Agriculture has been designated as the lead agency for the administration of the Pesticide Applicator Certification Program, including enforcement activities. The Board of Pesticide Control, within the Department of Agriculture, adopts regulations for pesticide use, sale, and disposal, and designates state-restricted and limited-use pesticides. Pesticides distributed within the state must be registered annually with the Department of Agriculture which also issues applicator certificates, permits to use limited-use pesticides and special-use permits for aquatic application. Cooperative agencies designated in the state certification plan include the State Cooperative Extension Service of the University of Maine, the Bureau of Forestry, the Department of Conservation, and six other state agencies.

The duties of the Office of Energy Resources include the allocation of petroleum products as specified under the federal mandatory petroleum allocation program; the preparation of a comprehensive energy resources plan; the preparation of a state energy policy; the encouragement and sponsorship of research and experiments to develop alternate energy resources; the preparation of an energy emergency contingency plan; the provision of public information on energy matters; the provision of technical assistance to public and private groups on energy planning; and the promotion of energy conservation.

Pollution Control and Abatement Programs

I. AIR

A. Introduction

The primary role of Maine's air pollution control program, which is located in the Maine Department of Environmental Protection, Bureau of Air Quality, is the enforcement of federal and state clean air regulations. However, professionals with the program believe that enforcement activity, despite its importance, is not given enough emphasis.

As far as non-point source pollution control in Maine is concerned, very little activity is devoted to this source of air pollution due to the absence of concentrated highway areas and congestive patterns. In instances of new highway construction where an Environmental Impact Statement concerning potential air quality degeneration is concerned, the Bureau will comment and help prepare and review the section of the statement which addresses itself to the potential ramifications of traffic patterns and their impact on local air quality. Presently, the budget of this program is $400,000 per year and is divided equally among federal and state contributions. Out of this total, $55,000 is generally invested in air pollution related equipment and other capital investments.

B. Workforce Profile

Functions of the Bureau of Air Quality Control, as well as its field offices, are as follows:

Bureau of Air Quality Control Functions

Division of Enforcement:
- Enforcement of ambient air standards, emission standards, and regulations
- Field activities--plant investigations, special air monitoring, stack sampling, visual emission evaluations
- Case development

Division of Air Quality Services:
- Planning--review of ambient and emission standards
- Air quality monitoring
- Liaison with federal agencies

Division of Industrial Services:
- Review of air pollution abatement plans
- Technical assistance and inspection programs, to assist plant operations and assure proper operation of abatement facilities
- Recommends licensing action to Board of Environmental Protection
- Conducts source-surveillance

Portland Regional Office:
- Provides field services and implements the agency's air strategies in the region

Bangor Regional Office:
- Provides field services and implements the agency's air strategies in the region

Presque Isle Office:
- Provides field services and implements the agency's air strategies in the region

An organizational chart appearing at the end of this section shows these Divisions in an integrated fashion.

The staffing level of the headquarters of the Bureau of Air Quality Control, as well as of its field offices, is depicted in Table I.

TABLE I

STATE OF MAINE

Maine Department of Environmental Protection
Bureau of Air Quality Control
Current (1976) Staffing Level

Position	1976
Director	1
Engineer	4
Chemist	3
Environmental Assistant	1
Engineering Technician	4
Environmental Aide	1
Secretary	5
TOTAL	19

In the private sector accurate workforce estimates are not available. Firms or their subsidiaries in Maine, which have at least one person responsible for air pollution abatement and control are: Scott Paper, St. Regis, Georgia Pacific, International Paper, Boise Cascade, Great Northern, Frasier Paper, Martin Marietta, Kennebec Pulp and Paper, and Central Maine Power. Generally, it is felt by Bureau spokesmen that the expertise in air pollution control and abatement methodologies, equipment operation and maintenance are not the best at these industrial locations and could be upgraded through extensive training and technical assistance. However, inadequate resources preclude any comprehensive effort in this regard.

C. Workforce Projections

In the last year and a half the Bureau of Air Quality Control has lost four employees due to low pay, better employment opportunities

elsewhere, and general dissatisfaction with the program. Currently, the program is finding it difficult to fill their four vacant positions because of the scarcity of qualified people in the State of Maine in air pollution control engineering or related disciplines. The Department's personnel department cannot advertise these positions outside of Maine due to the state's emphasis on hiring its own citizens. However, it is felt that through word-of-mouth these positions will probably be filled by 1977, likely with out-of-state individuals who choose to take up permanent residence in Maine.

Over the next five year period, the Bureau of Air Quality Control anticipates no increases in their current staffing levels due to no foreseen increases in either state or federal monies. Ideally, the Bureau would like to add a meteorologist and two more engineers to supplement current program activities.

D. Training and Certification

Job training available to state personnel employed by the Bureau of Air Quality Control is funded through an EPA grant. Professionals in the state program emphasize that the training available and accessible to its professional employees is extrememly limited. One typical reason, which explains the accessibility factor, is the State of Maine's current austere posture on out-of-state travel for training purposes. During 1976, four individuals attended a variety of short

courses sponsored in Boston by the EPA's Air Pollution Training Institute and the cost of travel and tuition was deducted from the Bureau's EPA assistance grant. Six other individuals in Maine outside of state government also participated in these air pollution courses. Generally, most training of professional employees of the Bureau comes in the form of on-the-job training. Additionally, each individual attends approximately two national conferences per year to remain current with the latest developments in air pollution abatement and control practices.

The needs for training are intense, and program officials would like to see EPA implement a training strategy which would: 1) not impose financial burdens on state program operating expenses; and 2) provide for a more effective delivery of services despite geographical location or numbers of employees.

E. Career Potential

Career potential in air pollution abatement and control in all sectors, public and private, does not appear very promising over the next five years. With no anticipated increase in program operation expenditures, it appears that no new careers will develop at the state level other than existing vacancies. In the private sector, workforce estimates and projections are not available, but general opinions provided by the Bureau's professionals seem to point to no significant increases in air pollution related careers in Maine's industrial sector. Finally, Maine will likely have no mandatory

inspection and maintenance programs for vehicular emission control devices; thus, no career potential exists in this area as it does in other adjacent states.

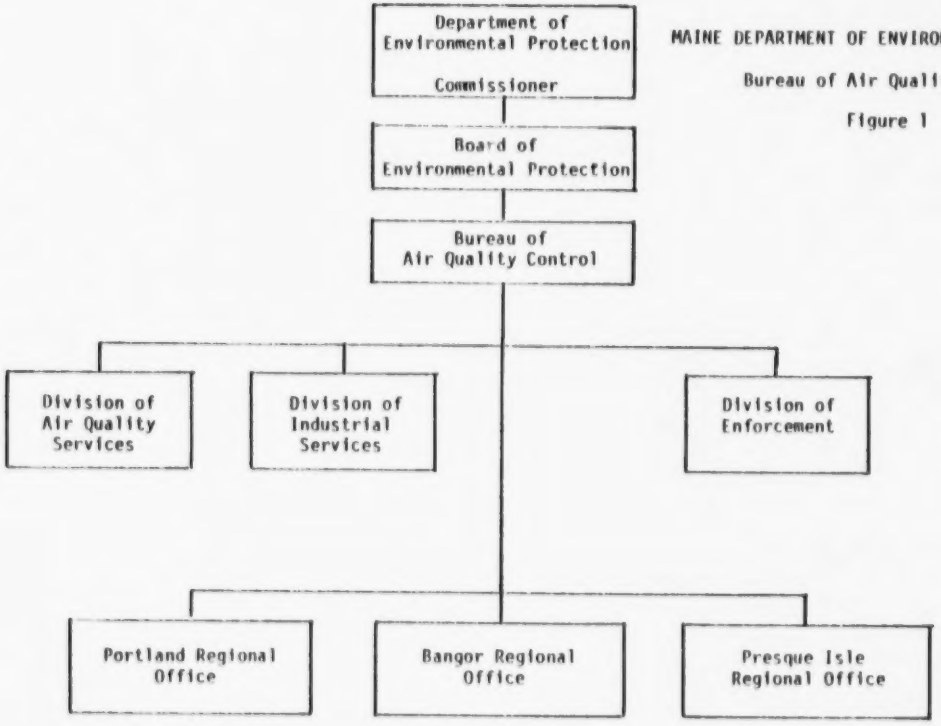
F. Conclusion

The Air Pollution Control Program in Maine has assumed varying delegation of authority under their State Air Implementation Plan. These include stationary sources, new source review, ambient air quality monitoring, and minor sources. There are no required transportation control plans or inspection and maintenance program in the implementation plan.

Currently, there is a problem in the program with the extent of available workforce and resources required for adequate implementation of a comprehensive statewide air quality plan. Although the program presently requires at least three more professionals, realistically, there appears to be no potential for workforce growth over the next five years. This is because of federal and state budgetary constraints. One estimate suggests that at least 42 full-time individuals should be employed by the program to ensure effective performance. This in itself represents over a 100 percent increase in current staffing levels and, clearly, will not be approached.

As far as training for Bureau employees is concerned, Maine appears to surpass the States of Connecticut and Massachusetts. Despite a higher level of commitment, however, the geographical

location as well as the limited financial resources of the program prohibit extensive training acquisition out-of-state. Accessibility and availability of training is an area which the Bureau would like to see EPA's air program address by developing a more intensive state delivery service.



MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION

Bureau of Air Quality Control

Figure 1

II. NOISE

The State of Maine currently lacks any Noise Control legislation; however, two departments do share responsibilities in noise abatement and control. The Maine Department of Transportation is charged with Environmental Impact Statement (EIS) review if noise assessments are included. This agency also regulates motor vehicle and powerboat mufflers within the state. The Maine Department of Human Services is charged with responding to any noise complaints within the state; however, again, they operate with no legislative mandate. Within this agency, the Division of Health Engineering has primary responsibility and it has been said that considerably less than one person-year is devoted to noise control. Noise is generally not a problem in Maine due to the state's rural nature; thus it does not appear likely that a formal program with legislative directives will be developing in the near future.

III. PESTICIDES

A. Introduction

Prior to 1975, pesticide control in Maine was accomplished under two laws, the Maine Economic Poisons Law and the Board of Pesticides Control Law. In 1975, the legislature repealed both laws and replaced them with amended versions to conform with provisions of the Federal Insecticide, Fungicide and Rodenticide Act. The major changes required by this legislation calls for all pesticides to be classified as to restricted or general use and for all applicators using restricted-use pesticides to become certified.

The new Maine Pesticide Control Act of 1975, provides for the registration of all pesticides sold or distributed in the state.

The original "Board of Pesticide Control Law" was passed in 1964, with the purpose of "assuring to the public the benefits to be derived from the safe, scientific and proper use of chemical pesticides while safeguarding the public health, safety and welfare". The law further stated that the public interest in the soils, water, forests, wildlife, agricultural and other natural resources of the state would be protected by regulating the sale and application of chemical insecticides, fungicides, herbicides and other chemical pesticides. Commercial applicators were required to be licensed and both commercial and private applicators were subjected to all other provisions regarding aquatic application, inspection of premises and spray equipment, and all regulations concerning mixing, storing, transporting, and disposing of pesticides and their containers.

The initial legislation gave the Board authority for controlling the sale and use of pesticides, but the manner for implementation was not well defined. The major revisions included in the 1975 Board of Pesticides Control Law clearly designate that dealers selling restricted-use pesticides must be licensed and that all applicators purchasing and using them must be certified.

The Maine Department of Agriculture is charged with responsibility for administering both pesticide laws. The Maine Pesticide Control Act of 1975 is solely the responsibility of the Commissioner and his staff while the Board of Pesticides Control Act of 1975, as implied, has a regulatory body attached to it. Originally, the Board was established as a separate entity, but the 106th Legislature placed it in the Department of Agriculture for administrative purposes and this arrangement was continued under the new law.

The Board is composed of the heads of eight state departments having pesticide responsibilities, i.e., Agriculture, Human Services, Conservation, Inland Fisheries and Wildlife, Marine Resources, Transportation, Environmental Protection and Public Utilities. A chairman is elected annually from the members and the group meets on a monthly basis. The Board employs a small staff to handle the day-to-day operations such as investigating complaints and licensing applicators and dealers. The Board of Pesticides Control has been concerned recently with the development, approval, and implementation of a state plan to certify all commercial and private pesticide applicators in the state

in conjunction with the Maine Cooperative Extension Service. This program ensures that those individuals who apply restricted-use pesticides possess the necessary skills and expertise to handle these chemicals.

B. Workforce Profile

The Board of Pesticides Control is responsible for both commercial and private pesticide applicator certification within Maine. It is aided in this mission by the Maine Cooperative Extension Service which was judged to possess the most effective delivery mechanism for providing training for applicators throughout the state. Additionally, the Division of Inspection is charged with the registration of all pesticide products marketed within the State of Maine.

The following table depicts the current staffing level of the Board of Pesticides Control.

TABLE II

STATE OF MAINE

Maine Department of Agriculture
Board of Pesticides Control
Current (1976) Staffing Level

Position	1976
Supervisor	1
Coordinator	1
Secretary	1
TOTAL	3

The coordinator is responsible for coordination between the Board and the Cooperative Extension Service in all applicator-related activities. Further, the services of game wardens are impacted on a seasonal basis.

The following table presents the staffing level of the Division of Inspection, which is devoted to pesticide registration activities.

TABLE III

STATE OF MAINE

Maine Department of Agriculture
Division of Inspection
Current (1976) Staffing Level

Position	1976
Supervisor	1
Inspectors	3
Clerical	1
TOTAL	5

The inspectors do not devote full-time to pesticide inspection/enforcement activities. They devote about one-third of their time to registration-related activities with the remainder devoted to feed and fertilizer inspections.

Dealers of pesticide products are licensed in the state. Currently, there exist 300 which are primarily agrichemical farm supply stores. The staff of these stores, who devote full time to pesticide marketing activities, has been estimated to range from a high of 15 to 20 at large establishments to a low of 1 (one quarter person-year) at smaller distributorships. On the average, there is about one full-time individual per establishment.

C. Workforce Projections

Once the mandates of FIFRA have been accomplished and commercial and private applicators have been trained and certified, the workload of the pesticide program may diminish somewhat. Thus, minimal or no growth is projected for the pesticide regulatory staff for the next five years.

State officials anticipate that a total of 2,636 commercial and private pesticide applicators will be certified by October, 1977. No increase in the size of the applicator workforce is projected to occur through 1981. Table IV depicts the distribution of certification between private and commercial applicators.

TABLE IV

STATE OF MAINE

Commercial and Private Certified Applicators
Estimated Workforce (1976 to 1981)

Classification	1977-1981
Commercial	361
Private	2,275
TOTAL	2,636

D. Training and Certification

Private applicators in Maine must be certified by the Board of Pesticides Control to purchase and apply limited or restricted-use pesticides. The application of these pesticides must always be supervised by a private certified applicator. To be certified a

4) Ornamental
   a) Arborists
   b) Floral and Turf Specialists
5) Seed Treatment
6) Aquatic Pest Control
7) Right-of-Way Control
8) Structural and Health Related Pest Control
   a) Structural
   b) Outdoor Rodent Control
9) Public Health Pest Control
   a) Biting Fly Pests
   b) Other Pests
10) Regulatory Pest Control
11) Demonstration and Research Pest Control

A commercial applicator desiring certification must demonstrate his competence to apply pesticides through a written examination including the following topics: 1) pesticide labeling, 2) safety, 3) environmental concerns, 4) pest organisms, 5) pesticides, 6) equipment, 7) application techniques, 8) applicable laws and regulations.

Certified commercial applicators must renew their licenses on an annual basis.

Training statistics for Maine can be seen in the following table. It should be noted that the summary numbers shown do not represent the number of certified applicators. All figures indicate the number of participants in individual applicator training sessions on a cumulative basis. For instance, one individual might elect to receive training in more than one licensing category; thus, this individual would be counted more than once in these figures. The chart merely shows the bulk of training needed, and the figures are not necessarily proportional in any way to the number of certified pesticide applicators.

private applicator must possess practical knowledge in the following: 1) pest recognition, 2) pesticide label comprehension, 3) pesticide application, 4) environmental effects of pesticides, 5) poisoning symtoms and treatment, and 6) Maine pesticide laws and regulations. These requirements can be fulfilled by either examination or attendance at training sessions sponsored by the Maine Cooperative Extension Service. Certificates must be renewed every two years.

Any establishment which distributes limited or restricted-use pesticides must be licensed by the Board, also. An individual who desires to secure a license must demonstrate, through examination, knowledge of the related dangers and necessary precautions for handling pesticides, as well as Maine laws concerning the use and sale of these products. Licenses must be renewed on a yearly basis.

Commercial applicators in Maine are certified according to the following categories:

1) Aerial Pest Control
    a) Agricultural by commodity
    b) Forest
    c) Right-of-Way
    d) Public Health
2) Agricultural Pest Control
    a) Animal
    b) Potatoes
    c) Apples
    d) Blueberries
    e) Vegetables
    f) Grain Crops
    g) Non-Food Crops
    h) General Agriculture
3) Forest Pest Control
    a) General Forest
    b) Timber Stand Improvement

Depicted is the current status of commercial applicator training, the extent of private applicator training activities, and the status of all pesticide applicator training in Maine.

TABLE V

STATE OF MAINE

Status of Commercial and Private Applicator Training

Anticipated Training Participants by October, 1977	Numbers Trained as of January, 1977	Numbers Still to be Trained by October, 1977
Commercial: 920	560	360
Private: 5,140	3,140	2,000
TOTAL 6,060	3,700	2,360

Source: Regional Support Branch, Operations Division, Office of Programs, U.S. Environmental Protection Agency

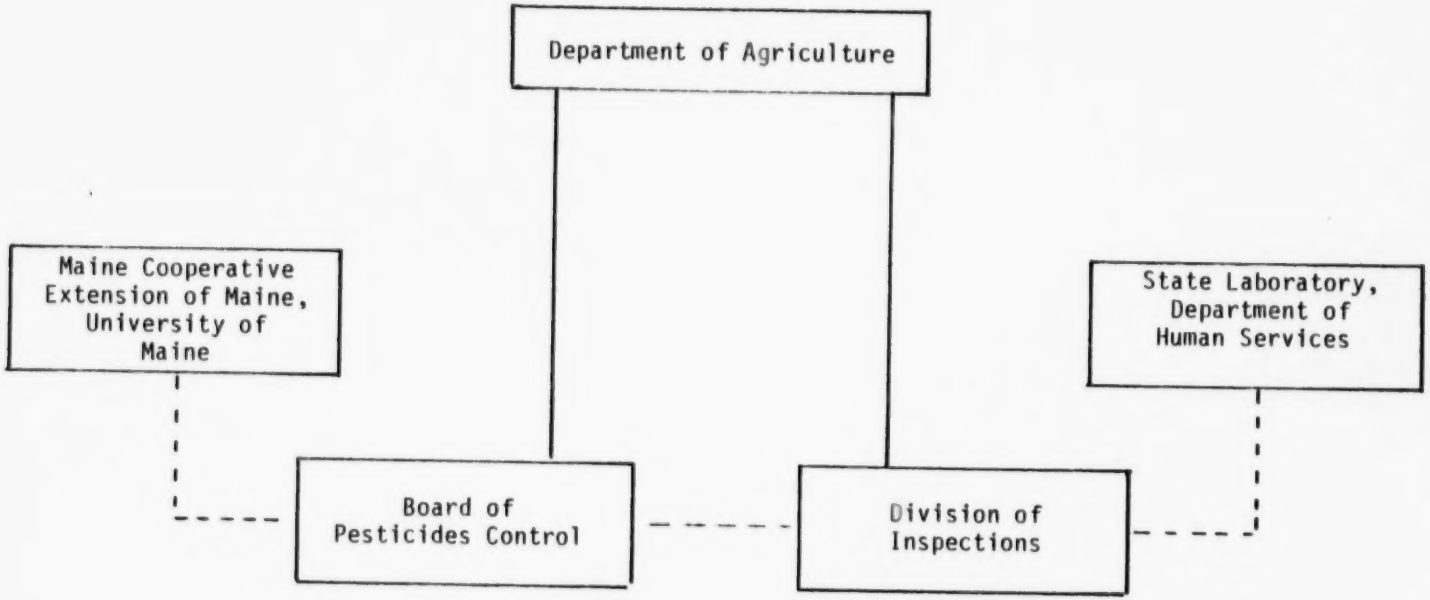
E. Career Potential

Career potential in the pesticide field is not expected to develop rapidly over the next five years. The workforce is established and attrition rates are expected to be low among applicators.

Field research suggests that integrated pest management (IPM) will be increasingly utilized, thus providing career opportunities both for degreed scientists and technicians. Although IPM is in a relatively early stage of development, the use of IPM techniques are likely to become more widespread as federal and state regulations become more stringent and as additional IPM research becomes available.

F. Conclusion

At the private/commercial applicator level, the workforce is currently being defined and once defined, its characteristics, i.e., turnover, new entries, will become better known; thus, enabling specific career potential and workforce projections to be determined. However, it has been suggested that the growth in the applicator workforce will be negligible. The state regulatory program is also expected to experience little growth over the next five years. Once the mandates of FIFRA are achieved, the workload will stabilize and additional personnel will not be required.


Department of Agriculture
Maine Cooperative Extension of Maine, University of Maine
State Laboratory, Department of Human Services
Board of Pesticides Control
Division of Inspections

MAINE DEPARTMENT OF AGRICULTURE

Board of Pesticides Control

Figure 2

IV. POTABLE WATER

A. Introduction

The Division of Health Engineering (DHE) of the Maine Department of Human Services (DHS), Health Bureau is responsible for administering Maine's Drinking Water Program. DHE's activities are supplemented by the Bureau's Public Health Laboratory which tests drinking water for its safety.

The Drinking Water Program of DHE supervises and enforces control over all public water supplies in the State of Maine and has recently been mandated by a revised act of the legislature to regulate the state's drinking water in a manner consistent with the Federal Safe Drinking Water Act (SDWA) of 1974, P.L. 93-523. The state mandate confirms Maine's desire to assume primacy under SDWA. State Primary and Secondary Drinking Water Regulations are called for and are required to be no less stringent than those promulgated by EPA under P.L. 93-523. Under this new act, any construction or alteration of a water treatment plant must meet with state approval and be supported by appropriate engineering studies when required. Operation and maintenance of public water systems as prescribed by state regulations are required as well as certification of operators in the state. State inspection authority and municipal operation and maintenance training are provided for under this new act.

Seventy-five percent of the population of the State of Maine is served by community drinking water supplies. Various sources

of public drinking water currently regulated are 186 water utilities, 100 subdivisions and mobile home parks, 2,000 schools and public eating places, and six to seven commercial spring water packaging companies.

B. Workforce Profile

The water supply program is located within Maine's Department of Human Services and receives support from both the Public Health Laboratory and the Health Inspections Unit. The Board of Certification for Water Treatment Plants and Distribution Systems comes directly under the Commissioner of DHS; however, a close working relationship is maintained with the water supply program. Table V depicts the current staffing level of the Water Supply program, the Public Health Laboratory, and the Health Inspections Unit.

TABLE VI

STATE OF MAINE

Department of Human Services
Water Supply Program
Current (1976) Staffing Level

Position	1976
Water Supply Program	
Engineer	1
Chemist	1
Biologist	1
Clerical	2
Subtotal	5
Public Health Laboratory	
Chemist	3
Technician	5
Subtotal	8

TABLE VI (Cont'd)

Health Inspections Unit	
Inspector (Technicians)	12
Subtotal	12
TOTAL	25

Currently, the State of Maine is receiving a $170,600 grant from EPA Region I to help it establish and administer a water supply program compatible with provisions of SDWA. During the second half of FY 1976, the program received an initial grant totaling $75,000.

Specifically, Maine may use these federal funds to: 1) formulate and adopt state drinking water standards at least as stringent as EPA's federal standards; 2) adopt a program to certify laboratories performing drinking water analyses; 3) conduct surveillance programs, such as sanitary surveys of water systems and the obtaining of information necessary to the granting and review of variances and exemptions to public water supplies; 4) review the design, construction, or modification of drinking water treatment facilities; 5) establish enforcement programs adequate to assure that individual water supplies perform adequately; and 6) set up and operate the data-keeping and reporting programs required by EPA regulations. The state match to support its water supply program amounts to $213,200, which brings the total program budget to a level of $383,800 for FY 1977.

The Maine Board of Certification for Water Treatment Plants and Distribution Systems is composed of five individuals representing

various facets of water supply as required by state law. The board is required to have two certified water supply operators (at least one Grade IV operator); one Department of Human Services representative; one Water Utility Management representative; and one educator whose field of interest is water supply.

The numbers of individuals employed as certified operators throughout the state is shown in Table VI. Class I has the least stringent requirements and Class IV the most stringent.

TABLE VII

STATE OF MAINE

Current (1976) Certified Water Treatment Plant and Water Distribution System Operators

Classification	1976
I	67
II	165
III	58
IV	16
TOTAL	306

In the State of Maine, then, there are a total of 306 certified water treatment plant and water distribution system operators, as well as 25 water supply regulatory personnel in the Department of Human Services.

C. Workforce Projections

Since 1974, only one professional employee has been added to the staff of the drinking water program. Employee turnover to date has been negligible (less than one percent per annum) and is the result of an extremely limited job market within the state.

Future growth through 1981 will be totally dependent on financial assistance available from EPA under the SDWA. State funding of the water supply program is not likely to grow. This stems from the fact that the state's priority commitment to its wastewater treatment facility construction grant program has precluded any increased assistance to water supply. It is estimated that 21.2 person-years will be required in FY 1977 and 24.2 person-years will be required in FY 1978 for the implementation of SDWA. It has been suggested that the potential addition of three positions (full-time equivalent) will be utilized for community system compliance with regulations promulgated under SDWA pursuant to the state's acceptance of primacy. Projections beyond FY 1978 are indeterminable and actual state level workforce growth will be a function of the growth in federal funding.

Specifically, for the three projected positions for FY 1978, it has been suggested that two of these individuals will be located directly in the drinking water program with the other position(s) located in the Public Health Laboratory. The two individuals in the drinking water program will require extensive backgrounds in technical planning and review for SDWA implementation. There does not appear to be any

projected growth in the Health Inspections Unit, and it is expected that current staff will satisfy anticipated needs.

The number of municipal operators is not likely to exceed the current level of 300 by any substantial amount over the next five years. However, the addition of a large number of entry-level operators will occur since Maine's water utilities have experienced high turnover rates. The lower classifications of plants and thus the lower grades of operators are often located in small municipalities which tend to offer low salaries and provide limited opportunitites for advancement. The higher grades of operators are more likely to work for the larger municipalities where job security, salary, and opportunity for upgrade are greater. While exact statistics regarding operator turnover are not available, it is evident that high turnover rates are a serious problem for many of the municipalities.

D. Training and Certification

Operator Certification in the State of Maine was established to protect the public health and ensure an acceptable quality of drinking water in the state. The program is currently operated by the Maine Board of Certification for Water Treatment Plants and Distribution Systems. This group comes under the auspices of the Department of Human Services. In addition to operator certification, the Board also classifies water utility systems which require chemical control. There are four basic levels of certification and classification for

operators and facilities. Every operator must hold a certificate which corresponds to the classification of the plant at which he/she is employed. The position of operator is defined by state legislation as the individual who has direct management responsibility of a public water system. Shift operators and other employees under the supervision of an operator are not defined as operators themselves and do not require certification.

Applicants for examination for certification and certified operators must meet the following minimum requirements:

> Class I: Operator shall have a high school education or equivalent. He shall also have one year experience at a Class I plant or higher, or one year experience in a waste water treatment plant or one year experience in an industrial process plant acceptable to the board, and must pass examination for Class I.
>
> Class II: Operator shall have passed an examination for a Class I and II and have a high school education or equivalent. He shall also have one year experience in a Class I plant or higher or one year experience in a waste water treatment plant, or one year experience in an industrial process plant acceptable to the board. Examinations for Class I and II may be taken concurrently.
>
> Class III: Operator shall pass examination for Class II and III and have a high school education or equivalent, and two years experience with a water utility. Two years of additional education may be substituted for one year experience, but there must be a one year minimum experience with a water utility. Examinations for Class II and III certification may be taken concurrently.
>
> Class IV: Operator shall pass examination for Class III and IV and have a high school education or equivalent, and four years experience with a water utility. Four years of additional education may be substituted for two years of experience, but there must be two years minimum experience with water utilities. Examinations for Class III and IV certification may be taken concurrently.

The following list describes Maine's system for classification of water utilities for certification of water plant operators:

Class I:

1) All other water treatment plants requiring chemical control of operation and which are designed to serve a population less than 15,000.
2) All distribution systems serving less than 15,000 population.

Class II:

1) All water treatment plants using filtration coagulation, sedimentation, filtration and lime-soda softening processes requiring chemcial and bacteriological control and designed to serve less than 2,000 population.
2) All water treatment plants using chlorination requiring bacteriological control and designed to serve a population less than 15,000.
3) All other water treatment plants requiring a chemical control of operation designed to serve a population in excess of 15,000.
4) All distribution systems serving between 15,000 and 50,000 population.

Class III:

1) All water treatment plants using coagulation, sedimentation, filtration and lime-soda softening processes requiring chemical and bacteriological control of operation and designed to serve between 2,000 and 15,000 population.
2) All water treatment plants using chlorination requiring bacteriological control of operation and designed to serve a population in excess of 15,000.
3) All distribution systems serving in excess of 50,000 population.

Class IV:

All water treatment plants using coagulation, sedimentation, filtration and lime-soda softening processes requiring chemical and bacteriological control of operation and designed to serve a population in excess of 15,000.

Examinations for certification are held at least once per year and generally consist of a written section as well as a demonstration of ability to use practical skills. The examination covers the fundamentals of proper operation of water utility as relates to source, pumping, distribution, disinfection, water treatment, public health, administration and regulation.

Certificates must be renewed on an annual basis with further examination required. Persons operating water systems not serving the public are not required to be certified, nor are individuals who operate water systems owned or controlled by the state or federal governments which do not serve water to the general public.

During the past two years the number of certificates issued by the Board has experienced a moderate growth. Additionally, the number of classified supplies should grow somewhat, pursuant to a more comprehensive definition of public water supplies contained within a 1976 act established by the Maine Legislature to regulate drinking water. Currently, every utility requires at least one certified operator; however, on the average, each facility has two or more certified individuals.

Training for municipal operators in Maine has been said to be a problem. The state's new Safe Drinking Water Act states that:

> The department may provide training in operations and maintenance of public water systems, techniques and methods of testing and analysis of water, and the requirements of this chapter and departmental rules and regulations, for suppliers of water and operators and employees of public water systems.

However, facilities and staff necessary for implementing authorized training are non-existent. The program is soliciting the interest of the state vocational educational system to develop career and upgrade training programs for water treatment plant personnel as no state colleges are presently geared up for technical training. In the past, the Clemson Correspondence Manual for water plant operators was promoted; however, efforts in this regard proved unsuccessful. Additionally, the local units of government in the state are hesitant to provide funds to train their treatment plant operators due to lack of available money and ignorance of training benefits.

Currently, Maine's fiscal budget has taken a rather austere position on tuition payments for state employees, thus limiting participation in federal programs. Moreover, travel authorizations to attend out of state EPA potable water seminars have been discouraged. Recognizing the obvious lack of consistent and adequate water supply training on the state and local levels, not only in Maine but also throughout New England, the EPA Office of Water Supply in Washington has developed and is implementing a thorough state and local training strategy for FY 1977. The following chart lists those training packages currently being developed along with scheduled dates of availability.

STATE OF MAINE

TRAINING PACKAGES CURRENTLY BEING DEVELOPED BY THE OFFICE OF WATER SUPPLY, UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, UNDER PHASE I OF ITS NATIONAL TRAINING STRATEGY WHICH COULD IMPACT MAINE

1. Safe Drinking Water Act (1974) implementation workshops and materials for local operators and officials

   - available March 1977

2. A basic operator training course for entry-level water supply personnel designed for delivery by state educational institutions and agencies.

   - available summer 1977

3. Laboratory certification courses for regional and state personnel involved in certifying chemical and bacteriological laboratories

   - available early 1977

4. Laboratory methodology couses in approved testing methods for regional, state, and local laboratory technicians

   - available summer and fall 1977

5. Sanitary survey courses in the methodology involved in surveying small water supply systems as well as more complex systems

   - available October 1977

6. Public notification short course for local suppliers to aid in handling public notification procedures

   - available summer 1977

7. Variances and exemptions course for state personnel to determine procedures involved in such instances under SDWA (1974)

   - available summer 1974

8. State training program management course for regional and state agency personnel in training planning

   - available spring 1977

E. Career Potential

Because workforce growth in the field of potable water is projected to be minimal over the next five years, career opportunities will be limited. The high rate of turnover among entry-level treatment plant operators suggests that job openings are continually available here. Several new technically-oriented career positions may become available in the state's drinking water regulatory program. However, no new or unique careers appear to be emerging in potable water management and unless funding levels are greater than anticipated, few career opportunities will develop.

F. Conclusion

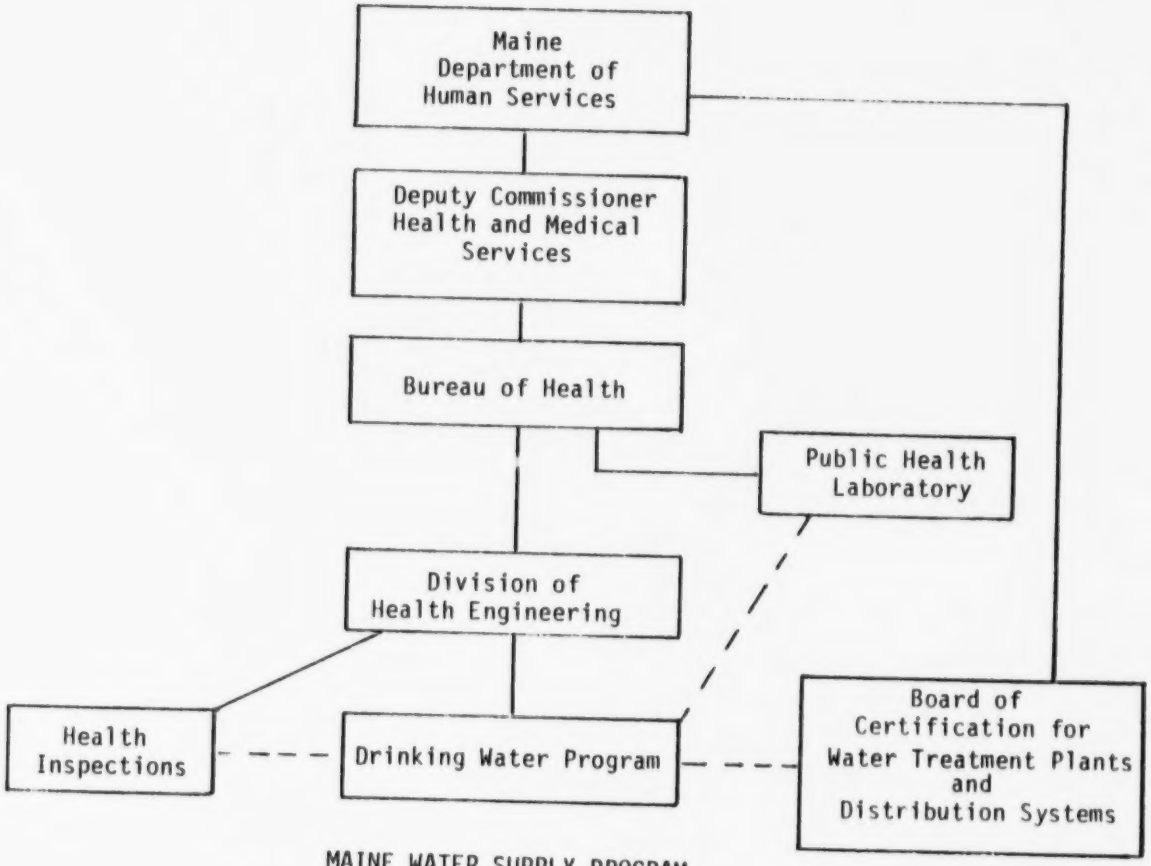
The water supply program in the State of Maine is proceeding according to schedule to accept primacy under the federal Safe Drinking Water Act. The necessary legislative mechanism is in place to comply with all federally promulgated standards under PL 93-523. The current state workforce is prepared to carry out all functions in potable water regulation and will grow only as a result of increased federal financial assistance.

At the local level, the operator workforce probably will not increase significantly, if at all. However, because of the rather high turnover rate among water utility operators, new entry level positions will be available. Training for local operators in the state is currently very limited, thereby exacerbating the problem of

high turnover. It should be emphasized that the highest rates of turnover occur in the small municipalities which can least afford to send operators to formal training sessions. Thus, mechanisms are needed to deal with the continual replacement of trained operators with unskilled personnel.

Maine's new Safe Drinking Water Act, which authorizes the state drinking water program to provide operations and maintenance training for all operators and other employees of public water systems, may help to promote expansion of the training effort. Currently, the program is working with the state vocational education system to devise a training delivery system, but sufficient numbers of personnel are not available to coordinate and conduct programs.

Finally, because of the limited projected workforce growth in the field of potable water, career potential is expected to be limited. At the state level it will be a function of magnitude of SDWA state assistance. While entry level jobs will be continually available at municipal water utilities, these jobs cannot be said at the present time to offer real career potential.



MAINE WATER SUPPLY PROGRAM

Figure 3

V. RADIATION

A. Introduction

The radiation program of the State of Maine is located in the Division of Health Engineering of the Maine Department of Human Services. The program currently monitors all sources of ionizing radiation including the state's nuclear power plant, Maine "Yankee". It conducts radioactive determinations or water, air, seaweed, plankton and shellfish samples, and medical use X-ray equipment.

B. Workforce Profile

The Institutional Health Program of the Division of Health Engineering is the state's principal radiation control group. The Public Health Laboratory, also of the Department of Human Services, provides environmental sample analysis capabilities for the program.

Table VIII represents the staffing level of the Health Inspections Unit.

TABLE VIII

STATE OF MAINE

Department of Human Services
Institutional Health Program
Current (1976) Staffing Level

Position	1976
Director	1
Radiological Chemist	1
Technician	1
TOTAL	3

Of the above three employees, only the radiological chemist devotes full time to radiation. The director also has responsibilities in noise and water supply. The technician, who conducts field samples, devotes one day per week to collection of radiological samples from the environment.

C. Workforce Projections

There are no projected increases in workforce devoted to radiation control within Maine over the next five years. The program has experienced no growth in the last two years and has had no attrition among employees. There are no nuclear power plants scheduled to come on-line within the next five years.

D. Training and Certification

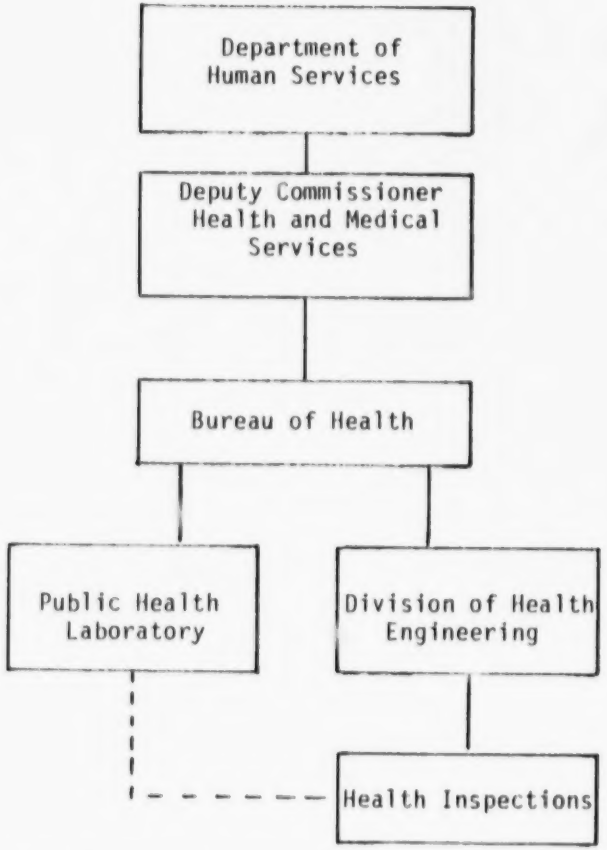
No formalized in-house training exists for the radiation program's employees, due in part to the small staff size. However, as far as other job training is concerned, the program does take advantage of existing federal level training. In the recent past, two employees have been sent to the Nuclear Regulatory Commission's ten week course at Oak Ridge entitled "Health Physics and Radiation Protection." The Program believes that this is an important core training course for its employees. Additionally, courses offered by the National Institute of Occupational Safety in Radiation Protection are also attended by program personnel.

E. Career Potential

Due to the absence of workforce growth over the next five years, as well as no foreseen turnover rate among the radiation program's employees, it appears as if new careers in radiation control will not develop within Maine government.

F. Conclusion

The radiation program of the State of Maine is currently at a plateau, as far as workforce is concerned, and it is expected that this will continue over the next five years. Federally sponsored training is frequently attended by program personnel to upgrade their skills. Career potential at the state level should not develop until after 1981 when a second nuclear power unit is scheduled to come on-line, thereby increasing the program's monitoring responsibilities.



MAINE RADIATION CONTROL PROGRAM ORGANIZATION

Figure 4

VI. SOLID WASTE

A. Introduction

The Solid Waste Management Act was passed by the Maine 106th Legislature and became Chapter 387 of Public Law. The act makes it unlawful for any person to establish, construct, alter, or operate any waste disposal facility or to store, collect, transport, process, or dispose of solid waste contrary to regulations promulgated by the Maine Department of Environmental Protection (DEP). Section 1304 charges DEP with the authority to establish rules and regulations it deems necessary governing solid waste management within Maine. These regulations were adopted and have been in effect since February 1, 1976.

The Division of Solid Waste Management is the arm of DEP responsible for implementing a comprehensive statewide management plan. The plan intends to provide all necessary health, safety, and environmental controls to protect Maine's public health and beauty, and to manage solid waste generated within the state. Concurrently, it is flexible enough to allow communities within the state to accommodate all restrictions created by population, waste volume, and geographic location. Educational resources, technical assistance, and cooperation are all tools utilized by the Division to ensure compliance with the state plan.

The state plan has basically five specific areas of concern. They are as follows: 1) Resource recovery activities, 2) Incineration 3) Storage and transfer facilities, 4) Land disposal, and 5) Variance procedures and conditional use permits.

Descriptions of each of these components follow and were provided by the Division of Solid Waste Management.

1.) Resource Recovery Activity: The Department desires to encourage solid waste programs, public or private, which will reduce the volume of solid waste generated which will reuse and recover valuable resources currently being wasted and which will conserve natural resources. Assistance given to these activities will be of the first priority.

The varied nature of resource recovery activity and the generally sound environmental basis on which they are undertaken preclude the necessity and value of specific regulation. A review of such proposed activity with respect to health, safety, and environmental soundness is deemed to be in the best interest of the state. Specific activity may, in the future, be subject to regulation.

2.) Incineration: Any person owning or operating an incinerator or other equipment using burning as a method of solid waste reduction shall submit a plan to the Department for approval showing how the incinerator will be integrated into the solid waste system. Such a plan should include but shall not be limited to the following items:

a. nature and volume of material to be burned
b. disposition of residual
c. location of processing and storage facilities
d. a financial report of estimated costs
e. a description of the facility and/or equipment to be used
f. safety equipment and procedures
g. fire protection facilities

3.) Storage and Transfer Facilities: Municipal and/or regional storage and transfer facilities including those facilities leased or contracted are subject to departmental inspection, review, and approval. The storage of all solid waste shall be practiced in such a manner as to minimize attraction and harborage of vectors, to prevent health and safety hazards, to minimize odor, unsightliness, environmental impact, and public nuisance.

4.) Land Disposal: The Department recognizes that for the short term, land disposal will remain a common method of waste disposal in Maine. Because it is the necessary final link in the chain of disposal activity, and because there is significant potential for environmental harm to land and ground water resources, in-depth regulation has been determined to be necessary. Regulations promulgated are based on the presumption that significant protection to the environment can be accomplished by controlling water in and around

disposal activity. Water supports the biological and chemical activity which produces potentially harmful by-products in the form of leachate. Water is also the primary vehicle which can transport these noxious substances away from the disposal site to ground and surface water resources. In addition, the regulations provide controls for other health, safety, and environmental matters.

Although Maine's regulations are believed to reflect the best state of the art for land disposal economically accessible to its communities, and will provide very much greater protection to land and water resources and to public health when compared with disposal methods now commonly used, it is recognized that compliance with these regulations does not provide an absolute guarantee against pollution. In those special cases where compliance with these regulations proves not to be sufficient, additional requirements may be imposed to provide additional protection to health, safety, and the environment. A variance procedure to enable disposal operation under a "Conditional Use Permit" has been established to allow maximum flexibility in considering sound solid waste activity.

5.) Variance Procedures and Conditional Use Permits: Any person responsible for solid waste activity may apply for a variance from regulations. The application may be accompanied by such information and data as may reasonably be required. A variance may be granted if it is found that:

   a. Proposed activity will not endanger human health and safety.
   b. Proposed activity reasonably ensures preservation of environmental quality.

At this time Maine lacks a comprehensive statewide hazardous waste plan and any move to establish one does not appear to be likely in the immediate future. However, the new Federal Resource Conservation and Recovery Act of 1976 should provide the motivation.

B. Workforce Profile

Currently the Division of Solid Waste Management is staffed as shown in Table IX.

TABLE IX

STATE OF MAINE

Department of Environmental Protection
Division of Solid Waste Management

Position	1976
Sanitary Engineer	2
Geologist	3
Engineering Technician	1
Geology Technician	1
Clerk/Typist	2
TOTAL	9

This level of staffing represents over a 100 percent increase from two years ago when only four positions made up the entire Division of Solid Waste Management. Since 1974, two geologists, one engineer, one technician, and one secretary have been added as a result of the Maine Legislature's desire to upgrade solid waste practices in the state. As mentioned previously, the mission of this group is to:

1) Regulate and control all solid waste disposal in Maine.

2) Provide technical assistance to all communities desiring such, and also aid them in securing necessary funds.

3) Implement a comprehensive Solid Waste Management Plan for Maine.

Within the State of Maine only one percent of the population is served by environmentally acceptable solid waste disposal facilities.

Currently there are approximately 445 sites for disposal in the state and a majority of these have been classified as open dumps. Most are publicly owned. Only one percent of the landfills in the state are under private control.

These previously cited statistics provided the basic impetus for the Maine State Legislature to mandate a comprehensive statewide plan. It is hoped that most of these sites for disposal in the state can be eliminated entirely and a regional approach established. Although not mandatory, the DEP is encouraging municipalities within a given region to pool their available resources and develop one or a series of environmentally acceptable landfills to serve the population. Due to the rural nature of Maine, this approach is an attempt to eliminate countless disposal sites serving only a small populace. Currently the Greater Portland Council of Governments is in the process of implementing a regional solution, and three other areas are undertaking feasibility studies to determine the possibility of regionalized waste disposal.

The disposal of sewage and sludge is also another increasingly important problem with which the Division of Solid Waste Management is concerned. Currently all septic tank pumpers are licensed within the state. Approximately 147 firms fall into this category. Generally, these septic tank pumping businesses are operated by only one person. Only about 35 firms employ more than one person. Ninety-eight to ninety-nine percent of their work is strictly home-owner related.

Additionally, it is expected that 78 waste water treatment plants in the state will require licensing for sludge disposal.

In 1974 a state appointed Resource Recovery Advisory Committee was formed to review resource recovery activities and opportunities in the state of Maine and to identify a logical direction towards recovery of resources from solid waste. The following conclusions and recommendations were made by the committee and printed in their resource recovery report to the Board of Environmental Protection.

CONCLUSIONS AND RECOMMENDATIONS FOR MAXIMIZING PRESENTLY ATTAINABLE RECOVERY OF RESOURCES FROM MAINE'S SOLID WASTE

Conclusion #1

The secondary materials industry is an essential element in recovering materials from solid waste.

Recommendations:

We urge local planning boards and other land use decision makers to recognize in their zoning ordinances the need for space in each community for the operation of legitimate secondary materials industries.

Conclusion #2

Junked automobiles are a valuable source for recoverable metal. The present laws concerning junked vehicles have not been effective in either removing the aesthetic blight of junked automobiles or moving them to metal recovery markets.

Recommendations:

Public solid waste disposal sites should include a separate area where citizens are encouraged to bring junked cars. State and local

officials are urged to utilize publicly-owned heavy equipment for the removal of junk vehicles to appropriated depositories when private enterpreneurs are unable to do so. State equipment and personnel could be particularly valuable in this regard in unorganized territories. Local officials offering municipal assistance and emphasizing enforcement of the "junk yard law" would help create a "push-pull" effect. The 107th Legislature is urged to enact legislation which would stimulate and stabilize the flow of junk vehicles to scrap processors. One mechanism might be the placement of a one dollar surcharge on the registration of new vehicles in order to establish a fund to be used to stimulate movement of junked vehicles.

Conclusion #3

Bulky metal products, such as white goods, and paper products including corrugated, news print, clean mixed paper, and to a lesser extent unimetallic cans are now marketable. Significantly increased recovery of these materials is now practical.

Recommendations:

Public solid waste disposal sites should include allocated space where citizens are encouraged to bring separated metal paper products for recovery and sale. Maine State government should take a leadership role and demonstrate the practicality of separating all corrugated and clean office paper and diverting it from a disposal facility to available markets and reuse.

Conclusion #4

A wide variety of paper products containing recovered and recycled fiber are presently available. Increased usage could stimulate market "pull" and further encourage recovery of paper.

Recommendations:

Maine State government should take a leadership role by reviewing its paper needs and by purchasing products containing secondary materials which are functionally acceptable and cost competitive. The state Board of Education should recommend to local school boards the purchase of products containing secondary materials when available at competitive prices. The Board should further publicize sources of paper containing secondary materials and assist with "pool purchasing" of this paper. The Department of Commerce and Industry in cooperation with Maine industry should publicize sources of products containing secondary materials, and should also publicize markets available to people desiring to sell materials recovered from solid waste.

Conclusion #5

Growth of the secondary materials industry in Maine, and/or growth of the transporation industry in Maine to feed the secondary materials

industry located within or without the state would stimulate the recovery of materials from solid waste. Significant incentive or disincentive to expansion of these industries may exist because of present laws and rules governing movement of secondary materials.

Recommendations:

The Department of Commerce and Industry should, in cooperation with the Public Utilities Commission, review all PUC and Interstate Commerce Commission rules regulating movement of junk vehicles, scrap and other post consumer materials both within Maine and between Maine and other states for the purpose of discovering and removing disincentives, if any, for shipping secondary materials versus shipping virgin materials.

Conclusion #6

The Department of Transportation because of its statewide activities, litter pickup program, leadership position with municipalities, and broad ranged purchasing program has the opportunity to play a leadership role in resource recovery activity.

Recommendations:

The Department of Transportation should take an active role in seeking to identify ways to recover resources and to utilize recovered materials. Such an opportunity may now exist in the area of litter pickup separation for recovered materials, for the recovery of truck and automobile tires, shredded for use in road repair and construction, and for the recovery of waste engine oils. Other opportunities may now or may in the future become apparent to those actively seeking them.

CONCLUSIONS AND RECOMMENDATIONS FOR RESOURCE RECOVERY PLANNING AND IMPLEMENTATION EFFORTS

Conclusion #1

Planning. Maine's low population density and long distance from major metropolitan areas make impractical the operation of large highly mechanized central resource recovery processing plants. These same factors hurt price competition of processed Maine Solid Waste being sold out of state. Area planning based on utilization of existing or proposed area industry as a primary market for plant or process steam or for recovered materials thus provides the most logical planning route towards resource recovery.

Recommendations:

Resource recovery planning for the State of Maine should continue on a sustained basis at the municipal and area levels and be coordinated at the state level. The committee suggests that Regional Planning Commissions would be appropriate coordinators of local

planning, and should undertake resource recovery planning in conjunction with area resource and economic planning. Responsibilities for state level coordination should be assumed by the State Planning Office. By this recommendation, the RCRA does not discount the value of county planning or interlocal planning already initiated in certain parts of the state. Such planning already underway should be encouraged and assisted.

Conclusion #2

Marketing of recovered resources whether for production of heat or for material content, is the most essential element of a resource recovery system. Use of the competitive market system will provide checks and balances on the economic soundness of the recovery system.

Recommendations:

Resource recovery planning should be undertaken in coordination with, and with the intent of utilizing local and area private enterprise.

Conclusion #3

Specific recommendations for procedures to implement resource recovery will result from the above planning process. The following should be key considerations:

A. Although it is too early to recommend a statewide resource recovery authority and processing system for Maine, we do see this as a future possibility. We predict that more localized resource recovery techniques can be advantageous in Maine because of its large area, low population density and specialized industries.

B. Maine is obviously disadvantaged from the standpoints of shipping recovered metals and glass to distant processing plants but we may have significant advantages over other areas with respect to the ability of our forest products-based industries to process combustible wastes as fuel, along with wood residuals. The paper industry in Maine may also offer opportunities for fiber recovery not necessarily found in all other areas. The small populations and remote locations of many of Maine's communities dictate small scale resource recovery operations.

Recommendations:

We recommend state level pursuit of federal assistance for demonstration grants to explore the feasibility and to promote resource recovery systems, featuring widely scattered small scale units with coordinated marketing and technical assistance. The State Planning Office in coordination with the Department of Commerce and Industry and with

the Office of Energy Resources should provide guidance and technical assistance to maximize revenue potential in resource recovery.

Conclusion #4

Municipalities and counties are faced with commitments to bring their solid waste disposal area into compliance with DEP regulations effective July 1, 1975.

Recommendations:

To make short term goals for meeting with the Solid Waste Management and Open Burning Regulations consistent with resource recovery planning the RRAC recommends consideration of the following.

A. Sanitary landfills will be needed long term to receive residual waste from resource recovery systems. They should be considered only an interim solution for receiving all solid waste.

B. In choosing landfill sites now, select those with recycling potential, therefore:

1) Favor those accessible to good roads and, if possible, rail transportation.

2) Recognize that even with maximum foreseeable resource recovery, local communities must still plan to dispose of stumps, demolition rubble, and emergency accumulations, all of which require a disposal site. A local staging area should be provided to consolidate junk cars, white goods and perhaps newsprint, cans and bottles since source separation will continue to be encouraged. Favor sites with long term potential for these purposes.

3) It appears that shredding raw refuse is fundamental to most foreseeable methods of processing for material or energy recovery. Investment in a carefully selected baler can be compatible with both future and interim processing requirements.

4) In general, capital commitments for interim solutions should be kept to a minimum within above guidelines.

Additionally, this committee recommended the establishment of a bottle bill which was finally ratified in November, 1976, by the citizens of Maine. The bill bans the use of flip-top cans and plastic six-pack rings and requires a minimum nickel deposit on all beer and soft drink containers. It does not prohibit the use of one way containers; however, sources suggest that economically speaking, refillables will take over the market unless major recycling efforts are initiated.

C. Workforce Projections

The effect of the new Resource Conservation and Recovery Act of 1976 on the solid waste program in Maine is indeterminable at this time. Limiting factors include the extent and degree to which federal requirements and standards are promulgated as well as the federal funding to be provided to support the state's program. Maine is looking forward to an increase in its federal solid waste grant as a result of PL 94-580, as it appears that no increases in state appropriations will occur. Most likely two to three additional positions will be created over the next five year period. Specifically, a soil chemist, a sanitary engineer, and a geologist will be requisitioned pursuant to an increase in Maine's federal grant. At this time no provisions have been made for a hazardous waste management plan and the impact which PL 94-580 will have on state workforce devoted to developing this task is presently unknown. Again, the extent of federal requirements imposed on the state will most likely determine the degree of involvement to which Maine will commit itself. Federal funding will again be the limiting factor.

At the municipal level it appears that regionalization of refuse disposal will most likely cause a decrease in the total number of operators. Currently, Maine requires on-site presence during all open hours, thus it has been estimated that the 445 disposal sites currently in operation have at least the same number of individuals responsible for operation. Person-years devoted to the operation of these sites

have been estimated to be around 260. Regionalization will result in a decrease in the total workforce; however, the composition of a typical site is expected to involve the addition of a number of low-skilled workers as regionalization calls for a larger labor intensive workforce at each landfill due to the consolidation of activity.

Additionally, regionalization will cause upwards of a 100 percent increase in collection-related workforce within the next five years. Eventually, it is projected that 30 percent of the state will be served by some type of collection services.

D. Certification and Training

Training and certification activities provided for personnel employed by the Division of Solid Waste Management are somewhat limited. It is the philosophy of the Department to hire individuals with sufficient field experience and then rely on informal on-the-job training to educate new professionals in the operation and function of the Division. Occasionally, employees attend EPA workshops; however, the frequency of these training sessions is considered too low. Additionally, the Division has a difficult time obtaining authorization for out of state travel which lends itself to little upgrade training, since most educational resources are located out of state in larger urban areas. Employees, however, are encouraged to avail themselves of univeristy related courses and a good deal of cooperation exists at this time between the University of Maine and the Division.

Training offered to municipal officials and landfill operators is considered to be absolutely essential to ensure a timely compliance with the new state solid waste law. Specifically, a training aid for a DEP sponsored seminar has been developed entitled "Site Selection and Development for Sanitary Landfill". Through this document and workshops, local planners learn how to locate a potential landfill site which will meet all the necessary requirements established by DEP. Additional on-site technical assistance is utilized by the Division of Solid Waste Management to train operators in the proper operation and maintenance of an environmentally acceptable landfill.

The new Federal Resource Conservation and Recovery Act is likely to aid Maine in the development of its training strategies considerably. This act authorizes EPA to make either grants or contracts with state solid waste programs to develop and implement training programs to train individuals for occupations in solid waste management. Additionally, funds should be made available under this act to train instructors and supervisory personnel to train or supervise the workforce involved in solid waste disposal. It is anticipated that training goals and activities for Maine's solid waste program will be upgraded if the Agency impacts the training funds available under this act. Explicitly defined state strategies for possible solid waste training in Maine have not at this time been approached.

E. Career Potential

Professionals within the Department of Environmental Protection project that the majority of new careers in solid waste management will come in the collection end of the business. As Maine moves towards regionalization of waste disposal, the composition of the local workforce will change from the present emphasis on landfill operators to a development of a collection-related workforce. Driver, jumper, helper, transfer station attendant careers will develop and grow concurrently with moves towards regionalization. Career potential in the Division of Solid Waste Management will be limited. As mentioned before, new openings will be staffed by geologists, soil scientists, and sanitary engineers, and will be pursuant to an increase in federal funding of the program.

Careers in resource recovery over the next five years appear to be limited, despite new federal legislation. The potential secondary materials market in Maine has been identified; however, the costs of developing this sector is prohibitive due to the transportation costs. Unless the value of renewable wastes rises with no increases in the cost of transportation, it appears that resource recovery will not be a viable alternative except on a limited and local basis. Source reduction seems to be the best approach to conserving available resources; however, this approach certainly does not impact the job market to any extent as it is primarily a public education approach.

F. Conclusion

The State of Maine has recently recognized the importance of limiting and controlling solid waste disposal practices within the state. It appears that the program is off to a good start; however, as in most instances, the program could justify an immediate doubling in staff at the state level to ensure a timely and thorough realization of its goals. Federal funding appears to be the only solution to this dilemma.

The outlook for careers in solid waste management in Maine is somewhat limited. The impact of the new federal law is directed toward the profitability of recovering reusable wastes; however, economies of scale have left rural Maine with little prospect for economically feasible resource recovery. The solid waste program will continue to provide technical assistance to aid municipalities interested in implementing local regulatory programs. Additionally, landfills in the state will decrease somewhat in number resulting in a more economically sound approach to waste disposal through regionalization. The composition of the workforce involved in landfills and collection should shift from the present emphasis on operators to a system more highly dependent on collection-related personnel.

Finally, hazardous waste disposal in the state has been said to be "up in the air". New federal requirements should call for a comprehensive statewide plan; however, at this time Maine has not initiated any planning for such a reality. The possible impact on the job market associated with the collection, transportation, and disposal of these wastes is at this time unknown.

VII. WASTE WATER

A. Introduction

Maine has been extremely successful in keeping its waters clean. According to a report by the Region I EPA Office in August 1976, 62 percent of Maine's major rivers and tributaries are suitable for fishing and swimming; and it is estimated that by 1983, the percentage will rise to 91. In addition, only one percent of the significant lakes in the state show any signs of eutrophication, the lowest rate in New England.

This success can be attributed in large part to Maine's expeditious implementation of the Construction Grants Program and National Pollutant Discharge Elimination System (NPDES) permits program, created under the authority of the FWPCA. Since Maine was first authorized funds totaling $153.1 million in 1973, under the Construction Grants Program, it has obligated over 90 percent of these funds, leading New England and ranking second in the nation in the percentage of funds obligated. Maine has made great progress in reviewing and processing construction grants and getting the projects underway. Through the NPDES permit program in conjunction with EPA, which has responsibility for administering the program, Maine now has every major industrial discharger in the state on an enforceable cleanup schedule. Program officials predict that the combination of reducing municipal discharges through the Construction Grants Program and industrial pollution through the permit program will lead to dramatic improvements in water quality over the next seven years.

In the area of water planning, Maine has assumed responsibility for Phase I basin planning and Phase II planning, including 208 activity. In the area of water quality monitoring, responsibility has been assumed for ambient monitoring and quality assurance.

B. Workforce Profile

The waste water program in Maine is administered through the Bureau of Water Quality Control (BWQC), which has the largest percentage of Department personnel and encompasses the most varied duties of any bureau within DEP. The Bureau incorporates seven divisions, each of which has responsibility for a specific aspect of the waste water program.

The divisions of the BWQC include the following: Industrial Services, Licensing and Enforcement, Municipal Services, Water Quality Evaluation and Planning, Lakes and Biological Studies, Laboratory and Field Studies, and Oil Conveyance Services. In addition, the Regional Office in Presque Isle deals with the serious industrial waste handling problems that result from the operation of paper mills and food processors.

The following is a breakdown of the Bureau of Water Quality Control depicting each Division and the staff involved:

Division of Water Quality Control
Chief
Assistant Engineers (2)
Planning Associate
Environmental Technician

Division of Industrial Services
Chief
Assistant Engineers (2)
Environmental Technician

Division of Municipal Services
Chief
Assistant Engineers (3)
Environmental Technicians (4)

Division of Licensing and Enforcement
Chief
Engineering Technicians (3)
Assistant Engineer
Environmental Technicians (2)
Secretary
Clerk/Typist

Division of Oil Conveyance Service
Chief
Assistant Engineer

Portland Office
Environmental Technicians (8)
Secretary

Bangor Office
Environmental Technicians (3)
Clerk

Division of Laboratory and Field Studies
Chief
Chemists (3)
Engineering Technicians (2)
Environmental Aide
Environmental Technician

Division of Lakes and Biological Studies
Chief
Biologist
Biologist Aide
Engineering Technician
Laboratory Technician
Environmental Technician
Secretary

Presque Isle Water Bureau Office
Regional Engineer
Assistant Engineer
Environmental Technicians (3)
Secretary

Table X below represents the combined staffing levels of all Divisions in the Bureau of Water Quality Control.

TABLE X

STATE OF MAINE

Bureau of Water Quality Control
Current (1976) Staffing Level

Position	1976
Division Chief	7
Assistant Engineer	10
Planning Associate	1
Environmental Technician	24
Engineering Technician	6
Environmental Aide	1
Chemist	3
Regional Engineer	1
Biologist	1
Biologist Aide	1
Laboratory Technician	1
Clerical	6
TOTAL	62

Current data on the staffing levels of the state's waste water treatment plants is not available. However, there are 275 waste water treatment plant operators who have been certified by the State of Maine, of which an estimated 150-200 are currently working within the state. Every plant employs at least one certified operator, and larger plants often employ more than one.

C. Workforce Projections

Specific workforce projections for the Bureau of Water Quality Control in Maine's DEP are indeterminable at present. However, as Maine assumes more responsiblity for water quality programs such as the NPDES Permit Program, which EPA is encouraging all the states to do, it is likely that increases in the workforce will follow.

At the local and private levels, workforce increases are inevitable, although formal projections have not been tabulated to date. The number of certified treatment plant opeators, which is now approximately 275, with 150 to 200 working within the state, is expected to increase to four or five hundred over the next five years. Maine has already obligated over 90 percent of its total construction grant funds; thus, new plants are in the process of being constructed and old plants are being upgraded to meet the 1983 deadline. At that time time all public treatment facilities must provide the best practicable technology for water pollution control, as mandated by the Federal Water Pollution Control Act. These activities will necessitate workforce increases in every area of waste water treatment plant construction and operation, creating jobs for engineers in various capacities, scientists, sanitarians, numerous categories of technicians, planners, as well as a variety of administrative and clerical support personnel.

Another factor which will affect workforce needs in Maine is the recent court decisions to release 137 million dollars in 208 planning funds throughout Region I and to require states to do 208 planning in

areas not already designated as 208 agencies. This, combined with the anticipation that EPA will be given over a billion dollars nationwide in sewage construction funds for FY 1977, is expected to create a substantial number of additional positions in all the New England states and municipalities from which Maine will benefit.

D. Training and Certification

There are approximately 90 waste water treatment plants currently in operation in the State of Maine. These plants are classified from I to VI, according to population served and degree of treatment. Specifically, Grade I is the lowest grade, and represents a primary treatment plant, whereas grades II through VI represent secondary treatment plants and are classified strictly in terms of population served, Grade II being the lowest and Grade VI the highest. This classification system is in the process of revision, at present, in an attempt to eliminate Grade VI. The breakdown of these classifications, respective populations served and certification requirements is depicted in Table XI.

TABLE XI

STATE OF MAINE

Classification of Waste Water Treatment Plants

Grade	Population Served	Certification Requirements
I		High school diploma or two years experience.
II	up to 5,000	Four years experience, of which two years can be substituted by a high school diploma or acceptable training program credit.
III	5,000 - 15,000	Five years experience, of which education may be substituted for three years.
IV	15,000 - 50,000	Six years experience, of which education may be substituted for three years.
V	50,000 - 100,000	Eight years experience of which education may be substituted for four years plus a minimum of four years of operation experience in grade III or higher.
VI	100,000 and over	Ten years experience (is now in process of being phased out).

To date there are 275 operators who have been certified by the State of Maine, approximately 150 to 200 of whom are currently working within the state.

Grades of operator certification are ranked according to the classification of treatment plant for which an operator is permitted to take charge. A person holding certification in a particular grade is permitted to operate all facilities in that grade and any lower

grade. Only the person who has management responsibility over a plant is required to be certified. Shift operators or other employees under the supervision of the manager need not be certified. Also, no certification is required of an operator who is a registered professional engineer.

The Maine DEP offers only one training program for waste water treatment plant operators; however, additional training is available through several schools within the state, as depicted in the following Table.

TABLE XII

STATE OF MAINE

Selected Waste Water Training Programs

Type of Educational Program	Sponsoring Agency	Duration and/or Degree
Waste Water Treatment Plant Operator Training in Process Control Techniques	Maine Department of Environmental Protection, Augusta	Six weeks
Environmental Control Technology (includes waste water treatment, industrial waste treatment, sanitary chemistry)	Eastern Maine Vocational Technical School, Bangor	Associate in Applied Science
Environmental Problems (water, air, waste water, energy)	Cony High School	15 weeks/evenings, adults
Waste Water Treatment Technology	Southern Maine Vocational Technical Institute New England Regional Waste Water Institute, South Portland	Nine month special water operator short courses/ mobile unit
Environmental Studies of pollution control (lakes, streams)	Nasson College, Springvale	Bachelor of Science; also in summers

TABLE XII (Cont'd)

Type of Educational Program	Sponsoring Agency	Duration and/or Degree
Environmental Sciences (environmental pollution, environmental chemistry, water pollution)	Unity College, Unity	Bachelor of Science in Environmental Science
Development and Implementation of Competency Based Modular Training	Maine Waste water Control Association, Winthrop	Held at Maine Vocational Technical Schools in Auburn, Bangor, Waterville, Presque Isle, South Portland, Calais

Students enrolled in the DEP training programs receive some on-the-job training in addition to their course work, thus making these programs more desirable than those which do not take this approach to training. At present, approximately 60 entry-level treatment plant operators are trained per year and 15 percent of the current operators receive upgrade training each year.

E. Career Potential

A substantial increase in career potential in the waste water field seems likely to occur at the local level at municipal treatment facilities and in the private sector. This will be the result of expanding construction, operation, and monitoring activities which will lead to a growth in demand for treatment facility operators, as well as laboratory, maintenance, labor and clerical personnel. With regard to operational personnel, field research suggests that their ranks may increase two-to threefold over the next five years; that is

from the present estimated level of 150 to 200 persons to a level of 400 to 500 persons. However, as in all areas of pollution abatement and control, career opportunities are contingent upon available funding for program expansion and training. If more funds are made available, demand will assuredly expand for professional, technical, and unskilled workers at both the state and local levels.

F. Conclusion

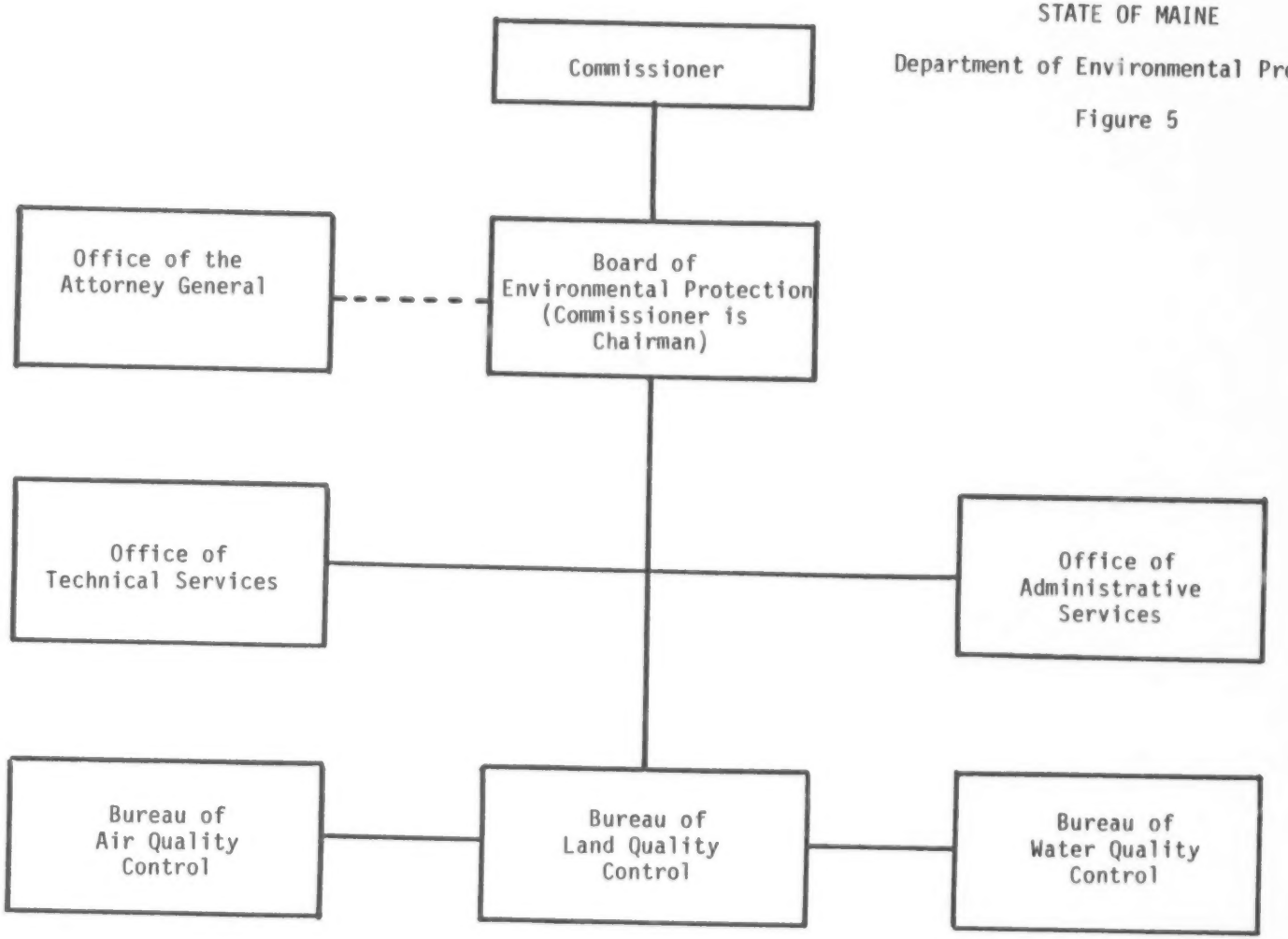
Largely as a result of the Construction Grants and NPDES Permits Programs, Maine has made great strides in the area of waste water treatment. As the program moves into the second phase of implementation of the Federal Water Pollution Control Act, new priorities will emerge, such as the control of non-point source pollution and an upgrading of 208 activities, for which Maine has already assumed responsibility. The number of certified treatment plant operators is expected to double over the next five years, and the construction and upgrading of treatment plants will most likely be accompanied by a demand for personnel in every existing program area, at least at the local level.

The results of these activities are tangible. Maine's waters are already among the cleanest in New England, and by 1983, 91 percent of its waters are expected to be suitable for fishing and swimming. If funds continue to be forthcoming from EPA, the future for Maine's waters looks bright.

STATE OF MAINE

Department of Environmental Protection

Figure 5


Commissioner
Office of the Attorney General
Board of Environmental Protection (Commissioner is Chairman)
Office of Technical Services
Office of Administrative Services
Bureau of Air Quality Control
Bureau of Land Quality Control
Bureau of Water Quality Control

VIII. ENERGY

Maine is the largest, most northeasterly, and least industrialized of the New England states. Energy use is principally for space heating and is highly oil dependent. One nuclear electrical power generating station, the Maine Yankee Atomic Power Plant at Wiscasset, has been operational since 1972. Its megawatt production capacity is 790. An additional plant, to be located at Sears Island and operated by the Central Maine Utility Company, is currently in the early planning stages. It is anticipated to have approximately 1,200 megawatt generation capacity, but cannot be brought on-line until the late 1980s.

The graph on the following page was prepared by the Federal Energy Administration, Region I. It depicts the potential savings in oil use projected for 1985 through available alternatives. Intensified energy conservation efforts show the highest single component potential for savings in oil usage. The savings which, on the graph, are attributable to the Sears Island nuclear generating station are questionable since the earliest projected completion date for the plant is 1986 and construction slippage will undoubtedly extend the start-up date.

Wood is also being considered as an alternative to oil and may replace it as a fuel source. This will be carried out through direct space heating and the conversion of small oil-fired electrical generating plants to wood burning facilities. Maine is 80 percent forestland, 98 percent of which is privately owned.

For the essential short-term conservation planning and the mid- and long-term efforts which must be developed concurrently, the Maine Office of Energy Resources was established in June 1975. In addition to fuel allocation as specified under the federal mandatory petroleum allocation program, the Office of Energy Resources, which employed eight people in 1976, is responsible for:

1) preparation of a comprehensive energy resource plan;

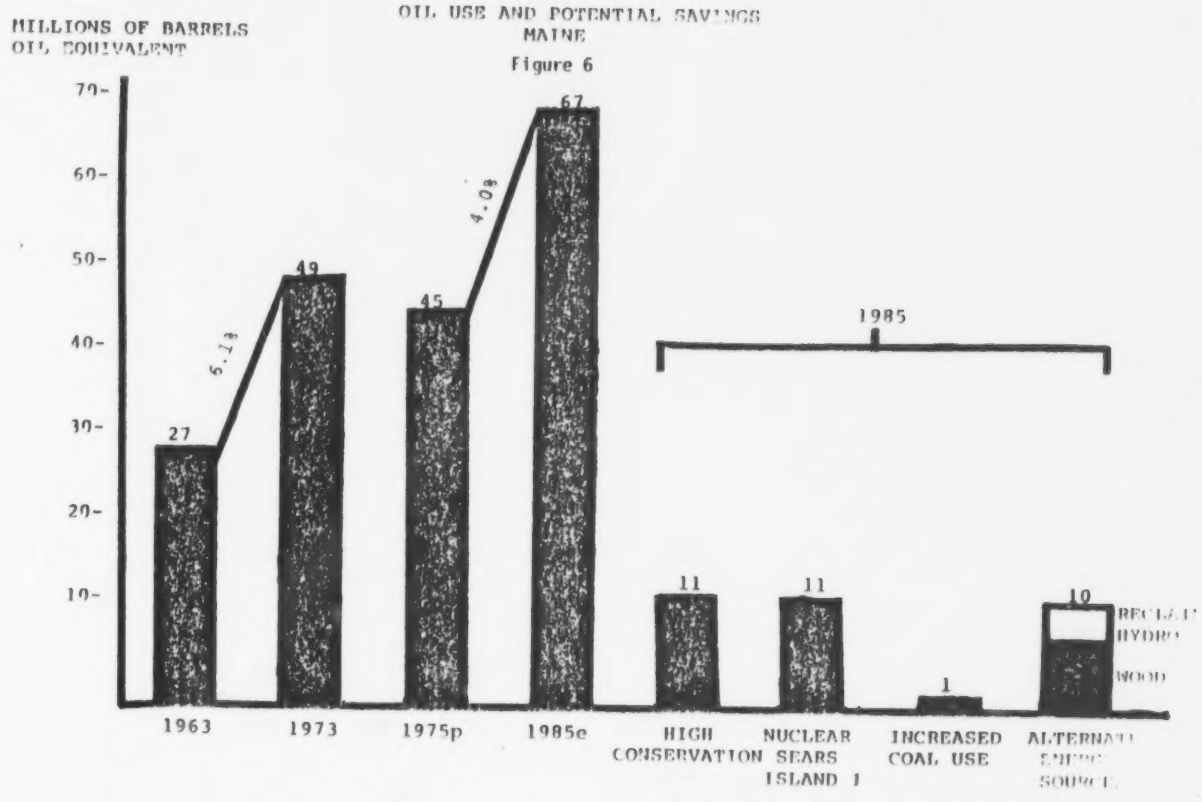
2) preparation of a state energy policy;

3) encouragement and sponsoring of research and development of alternative energy sources;

4) provision of public information on energy matters;

5) provision of technical assistance to public and private groups for energy planning.

The Office has published a variety of materials, including alternative energy information and a study of energy vulnerability in industry.



OIL USE AND POTENTIAL SAVINGS
MAINE

Figure 6

Selected Post Secondary Institutions With Formal Environmental Energy Programs

There are several colleges and universities in Maine which offer programs in environmental science and pollution control technology. Information on these programs was gathered from college catalogues selected on the basis of recommendations by professionals in the field and phone calls to department heads. Only a small percentage of the schools in the state were included in our sample; thus, the programs outlined in this section simply represent the kinds of pollution control training available in the state at the two year, four year, and post graduate college levels. These programs are designed to prepare students for technical or professional positions in pollution control and related areas.

Included in this section are Eastern Maine Vocation Technical Institute, which offers a program in Environmental Control Technology, leading to the degree of associate in science, and Nasson College, which offers a bachelor of science degree in Environmental Studies.

SENIOR INSTITUTIONS

Nasson College
Springfield, Maine

Program: Environmental Studies (B.S.)

Hours required for major: Semester - 65
Program Inception: 1970
Staff Size: Two professors, one associate professor, one assistant professor (4 Ph.D.)
Enrollment: 18
Graduates (1976): 1
Placement: 0
Graduate Work: 0

Courses

Energy and the Environment
Geology
Aquaculture
Agricultural Production
Energy: resources, conversion, and utilization
Environmental Engineering
Fisheries Biology
Forest Resources
Internship in Alternative Energy Systems
Marine Resources Utilization
Pulp and Paper Chemistry
Wildlife Management
Agricultural Economics
Cartography
Geography
Land Use and Planning
Resource Economics
Urban and Rural Sociology
World Populations
Plankton Analysis
Spectrophometric Identification
Water, Air Analysis
Meteorology
Sedimentology
Soils

COMMUNITY COLLEGES/TECHNICAL INSTITUTIONS

Eastern Maine Vocational Technical Institute
Bangor, Maine

Program: Environmental Control Technology (A.S.)

Hours required for major: Semester - 78
Program Inception: 1971
Staff Size: Two instructors (2 B.S.)
Enrollment: 25
Graduates (1976): 6
Placement: 4
Graduate Work: 0

Courses

Technical Mathematics
Pipefitters Drafting I
Technical Writing
Chemistry I
Environmental Control Technology
Technical Mathematics II
Communications for Technicians
Chemistry II
Physics I, II
Waste Water Treatment
Industrial Waste Treatment
Sanitary Chemistry I, II
Surveying
Environmental Control
Instruments and Controls
Contracts, Specifications, Codes, and Costs

State Legislation

MAINE GENERAL

TITLE:

Department of Environmental Protection Law
Maine Statutes 38-2 and 3

PURPOSE:

To create a department of environmental protection and to provide for improving the natural environment of the state.

DEFINITIONS:

ADMINISTERING AUTHORITY:

Department of Environmental Protection
Board of Environmental Protection

AUTHORIZATIONS:

To prevent and abate air, water and coastal flat pollution;
To assist local governments in pollution control and abatement;
To develop plans and act as state lead agency in water pollution matters;
To issue licenses regarding site locations, water discharge, and air emissions;
To permit scientific research exemptions;
To act as the state lead agency with respect to federal funds.

PROHIBITED ACTS:

To violate any provisions of the act or regulations pursuant to the act.

PENALTIES:

Fines of up to $10,000.

MAINE AIR

TITLE:

Protection and Improvement of Air Laws
Maine Statutes 38-4; 29-13

PURPOSE:

To provide for a statewide program to control air pollution and ensure the health, safety and welfare of citizens of the state.

DEFINITIONS:

1. Air contaminant
2. Air contaminant source
3. Air pollution
4. Air pollution control apparatus
5. Ambient air
6. Best practical treatment
7. Commission
8. Commissioner
9. Emission
10. Emission source
11. Fuel-burning equipment
12. Fugitive dust
13. General process source
14. Incinerators
15. Modification
16. Municipality
17. Opacity
18. Open burning
19. Person
20. Process weight rate
21. Region
22. Ringelmann chart
23. Waste

ADMINISTERING AUTHORITY:

Department of Environmental Protection
Board of Environmental Protection

AUTHORIZATIONS:

To issue regulations pursuant to the act;
To establish air quality regions;
To establish air quality standards;
To establish emissions standards;
To issue variances under the act;
To require registration of certain air contaminant sources;
To issue air contaminant licenses.

PROHIBITED ACTS:

To violate ambient air quality standards;
To fail to obtain any required license;
To violate specific pollution standards set in the act regarding visible emissions, open burning, fuel-burning equipment, incinerators, particulates, sulfur fuels, and other non-point emissions.

EXEMPTIONS:

Certain public projects, permitted limited burning, water vapors and similar emissions

PENALTIES:

Criminal fines from $200 to $25,000 per day;
Civil fines of up to $10,000 per day.

MAINE PESTICIDES

TITLE:

Board of Pesticides Control Law
Maine Statutes 22-1471A

PURPOSE:

To assure the public benefits to be derived from safe and proper use of pesticides, while safeguarding the public health, safety and welfare.

DEFINITIONS:

1. Agricultural commodity
2. Aircraft
3. Board
4. Certified applicator
5. Commercial applicator
6. Defoliant
7. Desiccant
8. Distribute
9. FIFRA
10. Fungi
11. Fungicide
12. Ground equipment
13. Herbicides
14. Insect
15. Insecticide
16. Limited use permit
17. Person
18. Pest
19. Pesticide
20. Pesticide dealer
21. Plant regulator
22. Private applicator
23. Restricted use pesticide
24. Under direct supervision of certified applicator
25. Weed

ADMINISTERING AUTHORITY:

Department of Agriculture
Board of Pesticide Control

AUTHORIZATIONS:

To certify private and commercial restricted pesticide applicators;
To license pesticide dealers;
To issue aquatic application permits;
To issue regulations regarding applicator categories, certification standards;

AUTHORIZATIONS (Cont'd)

To designate critical areas;
To generally enforce the act.

CERTIFICATION OR LICENSING:

Restricted pesticide dealers must be licensed; commercial and private applicators shall demonstrate competence and be certified; no exam for private applicators.

PROHIBITED ACTS:

To engage in restricted pesticide application without certification;
To engage in aquatic application without permit;
To sell or distribute pesticides without dealers license;
To violate the terms of any permit, license or certificate.

EXEMPTIONS:

Structural pest operators, certain forestry activities, licensed arborists.

PENALTIES:

First offense - fines up to $500;
Subsequent offenses - fines of at least $500.

MAINE POTABLE WATER

TITLE:

Water for Human Consumption Law
Maine Statutes 22-601

PURPOSE:

To provide for the control and ensure the safety of drinking water supplies of the state.

DEFINITIONS:

1. Contaminant
2. Feasible
3. Maximum contaminant level
4. National Drinking Water Regulations
5. Operator
6. Person
7. Political subdivision
8. Public water system
9. Supplier of water
10. Water treatment plant

ADMINISTERING AUTHORITY:

Department of Environmental Protection
Board of Certification

AUTHORIZATIONS:

To issue and enforce primary drinking water standards regarding contaminants and other quality criteria;
To issue secondary drinking water standards;
To approve construction and alteration of public water systems;
To monitor and inspect public water system operation;
To provide operation and maintenance training;
To issue emergency water supply orders;
To classify public water systems;
To certify public water system operators.

CERTIFICATION OR LICENSING:

Operators of public water systems shall be certified according to the facility classification. Examinations to show competency except for prior operators.

PROHIBITED ACTS:

For schools to use other than public or approved non-public water supply;
To fail to inform of supply noncomplicance;
To fail to comply with any rules and regulations;
To operate a public water system without certified operator;
To act as operator without proper certification.

PENALTIES:

Fines of up to $500 per day.

MAINE SOLID WASTE

TITLE:

Solid Waste Laws
Maine Statutes 38-3 and 13; 30-231

PURPOSE:

To provide for control over solid waste management and disposal to protect the state's environment and natural resources.

DEFINITIONS:

1. Board
2. Commissioner
3. Department
4. Municipality
5. Person
6. Recoverable waste
7. Solid waste
8. Solid waste disposal facility
9. Solid waste management

ADMINISTERING AUTHORITY:

Department of Environmental Protection
Board of Environmental Protection
Municipalities

AUTHORIZATIONS:

To issue regulations regarding solid waste management facilities and resource recovery;
To approve disposal sites;
To provide local solid waste disposal facilities;
To provide for the disposal of all septic tank and cesspool waste.

PROHIBITED ACTS:

To dispose of forest products, potatoes or other refuse into waters of the state;
To locate solid waste disposal facility within 300 feet of water;
To construct, alter or operate solid waste facility contrary to regulations;
To improperly dispose of septic tank or cesspool waste.

EXEMPTIONS:

Facilities existing prior to October 1973.

PENALTIES:

Fines of from $100 to $500 per day.

MAINE WASTE WATER

TITLE:

Protection and Improvement of Waters Law
Maine Statutes 38-3

PURPOSE:

To provide for the classification of and control of pollution to waters of the state.

DEFINITIONS:

1. Discharge
2. Coastal streams
3. Fresh surface waters
4. Municipality
5. Person
6. Pollutant
7. Tidal waters
8. Transfer of ownership
9. Waters of the state

ADMINISTERING AUTHORITY:

Department of Environmental Protection
Board of Environmental Protection

AUTHORIZATIONS:

To classify bodies of water in the state;
To provide financial and other assistance in pollution abatement efforts;
To issue water and waste pollutant discharge permits;
To act as the state lead agency in water pollution matters;
To issue permits regarding log driving and storage;
To appoint water quality monitors;
To issue regulations pursuant to the act and to generally enforce the act.

PROHIBITED ACTS:

To discharge oil into waters of the state;
To discharge forest products, potatoes or other refuse into waters;
To sell or use high phosphorus detergents;
To discharge mercury, radiological or other hazardous substances;
To discharge waste from watercraft;
To violate any license issued under the act;
To discharge any pollutant without a proper license.

EXEMPTIONS:

Dairy equipment, food processing plants and industrial uses of high phosphorus detergents.

PENALTIES:

Fines of from $200 to $25,000.

MAINE WASTE WATER

TITLE:

Sewage Treatment Operators Law
Maine Statutes 32-62

PURPOSE:

To provide for the certification and classification of sewage treatment plant operators.

DEFINITIONS:

1. Board
2. Certificate
3. Operator
4. Wastewater treatment plant

ADMINISTERING AUTHORITY:

Board of Environmental Protection

AUTHORIZATIONS:

To classify all wastewater treatment plants;
To specify operator qualifications for treatment plants;
To certify wastewater treatment plant operators;
To issue regulations pursuant to the act.

CERTIFICATION OR LICENSING:

Operators shall be certified by examination or otherwise according to facility classification; prior operators need not be examined.

PROHIBITED ACTS:

To operate a waste water treatment plant without properly certified operator;
To act as an operator without proper certification.

PENALTIES:

Violations constitute misdemeanor.